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5.2.23

The Journal of the Department of Agriculture of Victoria, Australia.

January, 1923.

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Passion Fruit Culture

Elmore Crop Competition

The Fruit Industry of Victoria

Dairying in Gippsland

Weeds and their Eradication

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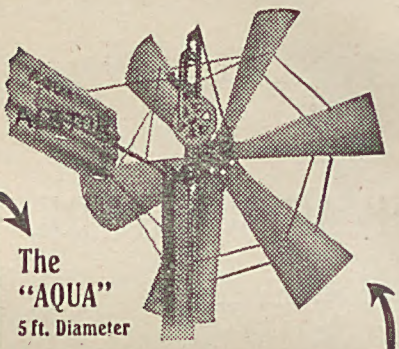

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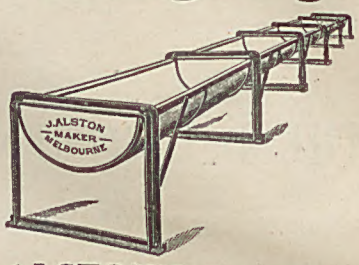

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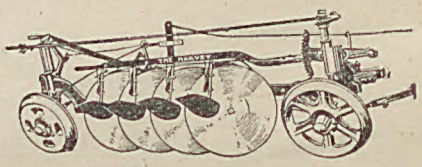

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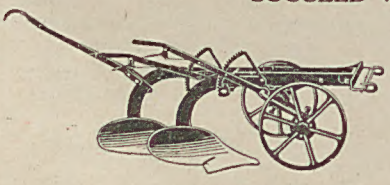

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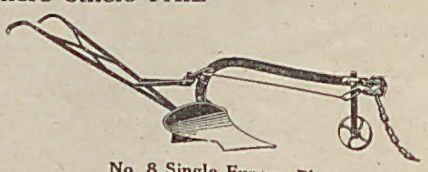

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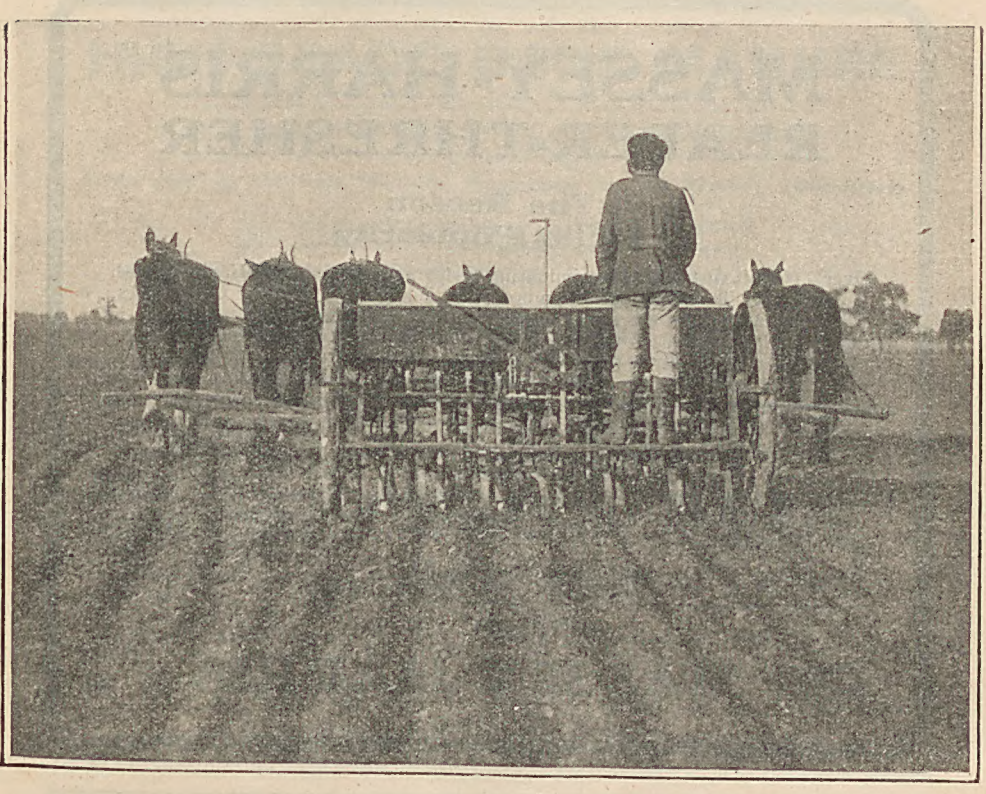

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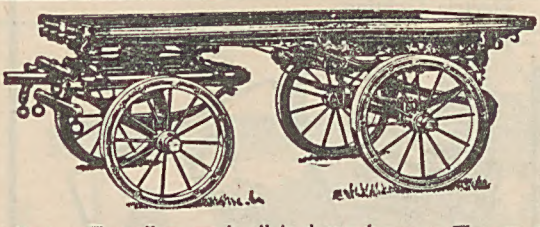

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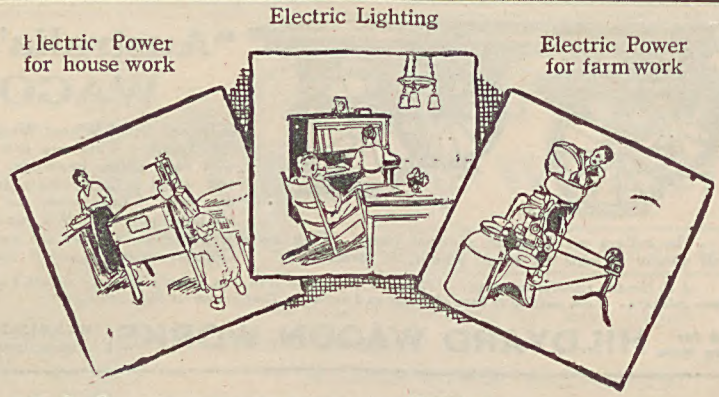

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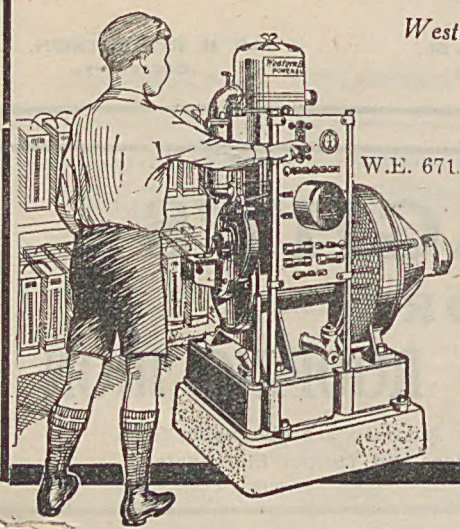

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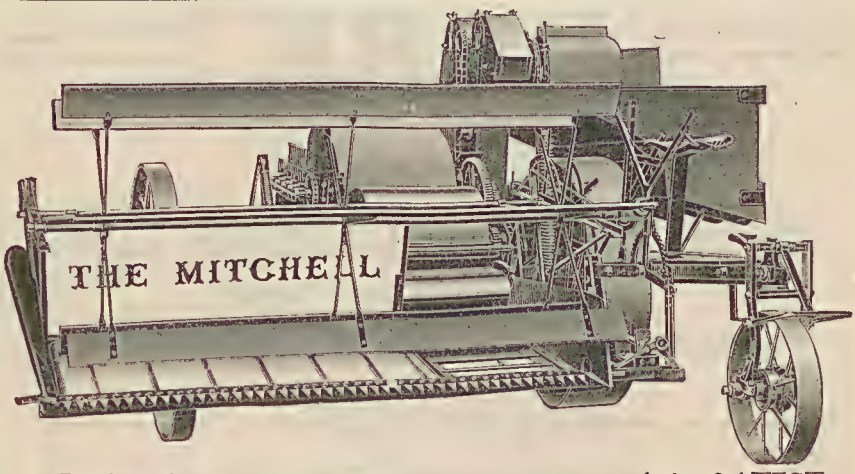

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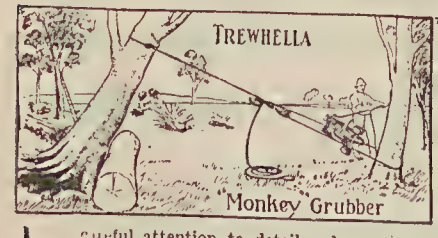

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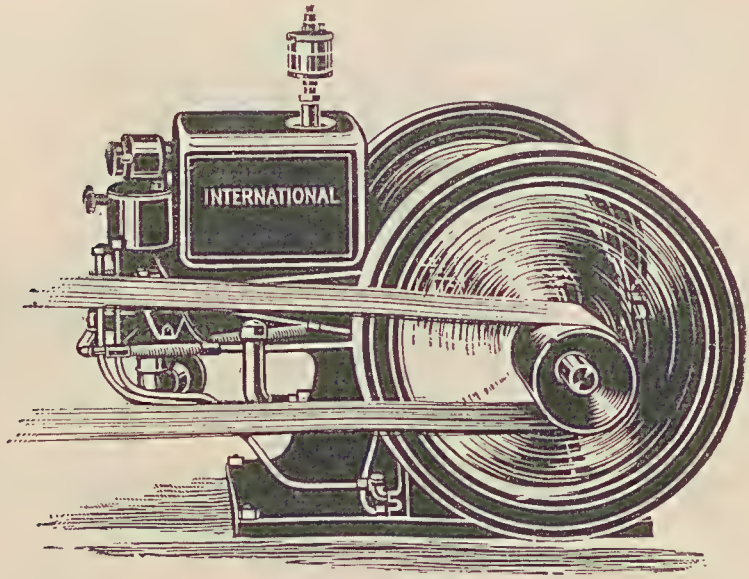

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FRUIT INDUSTRY OF VICTORIA.

The Present Status and Future Outlook from a Commercial Stand-point.

By E. Mecking, Senior Fruit Inspector.

PART I.

Introductory—Effects of the War.

Since the last articles under this title appeared in this journal for October, 1914, the fruit industry, in common with all other industries, has passed through the ordeal of the world war, and the abnormal conditions created thereby both during the period of hostilities and since the signing of the armistice; in fact, the industry has been so profoundly affected that its present position and future outlook have undergone very material alteration.

For the first year of the war the export of fresh, dried, and canned fruits was completely cut off, and it seemed that the export section of the industry would be temporarily extinguished. By arrangement, however, with the Navy Department in 1916, the trade was resumed, and owing to the increase in the purchasing power of the British public, record prices were obtained, and the quantity shipped was greater than in any previous season. Large army contracts were also placed with the Imperial, Indian, and American Governments, for jams and canned fruits, which resulted in an abnormal and unprecedented expansion in the export trade of these commodities. As a consequence of these circumstances, the fruit industry until the end of 1919 was in a better position than it had ever been, and growers and others concerned were receiving higher and more remunerative returns.

By 1920, however, practically the whole of the allied armies were disbanded, unemployment was making itself manifest in the United Kingdom, and the purchasing power of the public in all the countries

on the Continent of Europe and elsewhere had declined to below the pre-war level. The large trade which Victorian exporters had built up with Germany had completely ceased, and no compensating outlet, either in the United Kingdom or any other European country, could be found. Production costs in Victoria were at the same time much above the pre-war level, and up to the present have shown little, if any, decline. Although the purchasing power of the Australian public has been very little affected by the war, or the resultant conditions, little relief to the industry has been obtained from this fact, as under our present methods of distribution and marketing very little increase in local consumption has been possible.

The industry, therefore, is faced at present with the following disabilities:—

(*a*) Production costs much in excess of pre-war level;
(*b*) A curtailment of the export trade in fresh and canned fruits and jams; and
(*c*) Increasing production in most sections of the industry.

In 1911 the consumption and distribution of fruit in Victoria was given as follows:—

	Per cent.
Export to other States	13.5
Oversea export	8.8
Manufactured into jams, canned fruits, &c.	27.3
Converted into dried fruits	1.09
Local consumption	49.0

These percentages were from a total of 3,583,059 bushels of large fruits, and 58,918 bushels of small fruit, a total of 3,641,977 bushels, exclusive of grapes.

In addition to the above, 785,106 bushels were imported from other States, and 81,560 bushels were imported from oversea, giving altogether an equivalent of 2,648,879 bushels of fruit consumed in Victoria. These figures were quoted in this journal for November, 1912. They then worked out on the population basis at a consumption of three and a half ounces of fruit per day per individual. Since these figures were given the position has not materially altered.

In 1921 the percentages were as follow:—

	Per cent.
Export to other States	13.65
Oversea export	4.7
Manufactured into jams, canned fruits, &c.	23.7
Converted into dried fruits	2.21
Local consumption (as fresh fruit)	55.73

These percentages were from a total of 3,999,599 bushels raised. To obtain the consumption 1,429,316 bushels imported from other States, and 65,800 bushels imported from oversea should be added, and 734,097 bushels exported to oversea countries and other States deducted, which will give a total of 4,760,618 bushels consumed in Victoria for 1921, or an approximate average daily consumption of fruit in all forms of five ounces of fruit per day per head of population.

The canning and jam-making section of the trade is that which has been most materially affected by the war and after conditions, and the growers of canned fruits, particularly the growers of canning varieties of

peaches, are faced with the prospect of largely increased production, with no corresponding outlet for the disposal of their crops.

The position has been relieved in 1921 and 1922 by the establishment of Commonwealth fruit pools, which have enabled the growers, under advances from the Commonwealth Government, to continue in the business. As another pool will probably be formed for the 1923 season the growers of canning peaches will be tided over their difficulties for at least another season. There is very little doubt that had these pools not been formed the peach crop could not have been disposed of at profitable prices, as the private facilities for processing and distributing the whole of the present production would have been quite inadequate for this purpose. This relief, however, is only temporary.

With the resumption of trading facilities throughout the world the competition on the oversea markets in fresh, dried, and canned fruits has become very keen. The fruit industry of Australia is therefore faced with the position of high local production costs and keen outside market competition. To keep the industry going two methods are possible—(*a*) increased local consumption of fruit within Australia, and (*b*) the expansion of oversea markets. The only means by which either or both of these may be brought about are by cutting costs of production to a minimum, the improvement in present system of distribution and marketing, and the introduction of standardized methods of preparing fresh, dried, and canned fruits for market.

Subsequent articles will endeavour to point out the present disabilities in these matters, and also the means by which they may be removed.

(*To be continued.*)

"PERSIAN LAMB."

Dr. Omer H. Patrick, who can claim to be the only breeder of Karakul sheep in the British Empire, gave some interesting details of the Persian lamb industry. He said that what is known as Persian lamb fur is really derived from the pelts of the young of the Karakul sheep, which are natives of Bokhara in Russian Turkestan. Dr. Patrick is a pioneer in breeding these valuable animals in Canada, and on his ranch near Calgary, Alberta, he maintains a flock of a thousand head, some pure Karakul and some crossbred with British domestic sheep.

"This new industry has been in existence over eight years," Dr. Patrick stated in an interview. "In 1913 I was asked to take over a few Karakul sheep, imported from Bokhara, which had not taken kindly to Eastern Canada. The animals have thrived in Alberta, and are strong opponents of 'race suicide.' My experiments in cross-breeding have proved thoroughly satisfactory, and, in addition to disposing of the pelts and meat, I am now selling live animals to other farmers. I believe there is a big future for Karakul breeding in Western Canada."

As illustrating the value of this fur it may be stated that the coat of Persian lamb fur worn by Mrs. Harding, wife of the President of the United States, in the past winter cost nearly £6,000.—*New Zealand Farmers' Advocate*, Nov., 1922.

PASSION FRUIT CULTURE IN VICTORIA.

(Continued from page 768, vol. xx.)

By J. Farrell, Orchard Supervisor.

IV.—Preparation of Land.

The passion, like most other fruits, both large and small, thrives better on virgin soil than on land previously cultivated, and especially where cereals have been grown for lengthy periods, and most of the young plantations are being established on new land. When the preliminary essentials—locality, climate, and soil—have received consideration, the site selected for the plantation should be cleared of all native timber and the roots of same carefully removed to a depth of 18 inches to obviate the possibility of native pests and diseases attacking the vines. The removal of the roots also facilitates deep cultivation in preparing the land for planting. When the grubbing is finished, the plane of the site may be graded to remove surface inequalities, and crab-holes should be located and filled in. Then, if not subsoiled, the land should be ploughed to a depth of from 10 to 12 inches, according to the depth of the surface soil. During winter is the best time for grubbing; grading and ploughing may be done afterwards, as soon as the land is in a fit state. Cultivation should then be continued during the following summer and autumn to get the land into a mellow, sweet condition to receive the young vines in the following September or October, when the frosts are over.

When it is intended to utilize previously-cultivated land, this should be ploughed, and, if necessary, graded and brought into a fine state of cultivation prior to planting. In grading the red friable soils, primitive locally-made wooden implements are used to do the work of buck-scrapers and slickers.

The passion vine has a great aversion to sour soil conditions, and particularly if these are created by stagnant water. In preparing the land, therefore, this aspect should be considered, but the subsoil of the red land is almost invariably of a porous nature, offering free natural drainage. Where these favorable conditions are non-existent, however, sub-drainage should be provided. While good natural drainage is desirable, it should be remembered that the great fault with the red soil is that, in some places, its subsoil is too porous, and consequently in hot weather, and when water is not available, growers are obliged to resort to extra-intensive cultivation to maintain sufficient soil moisture for their vines.

V.—Planting Out and Erecting the Trellises.

The soil having been brought into a fit state of tilth to receive the young vines, pegs are used to mark the exact positions in which they are to be planted. Formerly a great diversity of opinion existed among growers as to the most suitable distances apart to plant. Some adopted 9 ft. x 9 ft., 10 ft. x 10 ft., 10 ft. x 12 ft.; others 10 ft. x 14 ft., 12 ft. x 14 ft., 12 ft. x 16 ft., &c. It is now generally recognized, however, that the most suitable distances apart are 12 ft. x 18 ft.—that

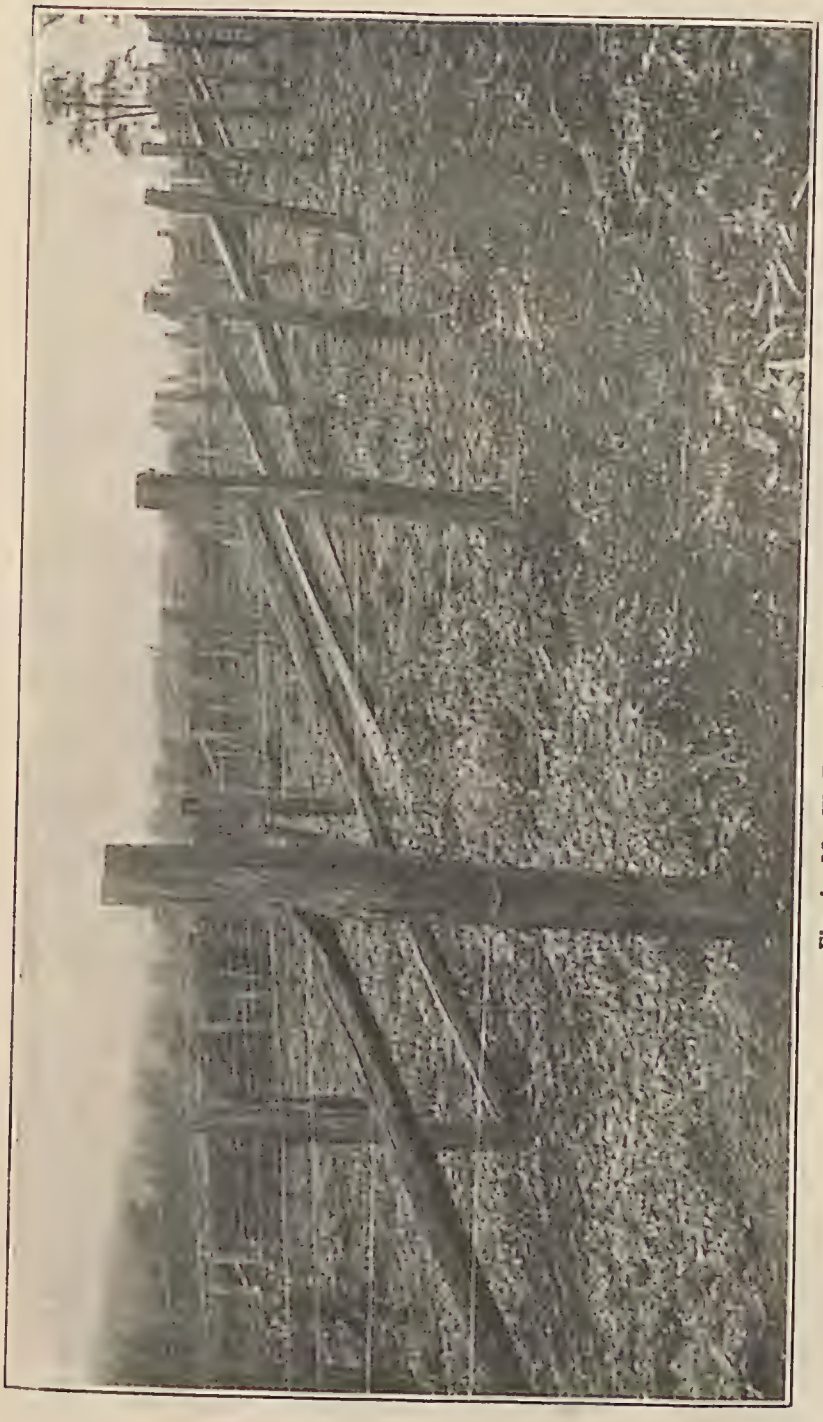


Fig. 4.—Mr. W. Bowman's Trellises at Silvan.

is, 12 ft. between the rows and 18 ft. between the vines in the rows. The 12 ft. spaces between the rows admit sufficient light and air to the vines, and facilitate proper cultivation; while the 18 ft. spaces between the plants in the rows afford natural expansion of the fan-shaped structure which they are made to assume when being tide up on the trellises. The end headlands are usually 20 ft. wide, this being sufficient when cultivating, spraying, &c., while those at the side are only 12 ft., cross-cultivation, &c., being precluded by the wire trellises which run from end to end.

Frequently the trellises are erected before planting the vines. This is done by placing the first or corner post of the block 20 ft. from the end and 12 ft. from the side fence. The remainder of the first row of posts are placed in a straight line at the distance stated from the side fence, and 18 ft. apart to the other end, where another 20 ft. headland is provided. The second row of posts is placed similarly 12 ft. from the first, and so on, until all those necessary for trellising the block are in position. The posts are almost invariably made of rough split timber 6 in. x 6 in., 7 ft. to 8 ft. long, from 2 ft. to 3 ft. being placed in the ground, leaving about 5 ft. above the soil level. Three to five 8 to 10-gauge wires are employed to support the vines, the weight of which, with the tight condition of the wires, exercise a considerable strain on the end posts.

To keep these rigid, however, they are supported by stays as shown in Figure 4, which illustrates a section of the trellises recently erected by Mr. W. Bowman on his passion block at Silvan. In setting out the young vines one is planted midway between each two posts in the trellis, and exactly beneath the wires. Thus the vines will also be 18 ft. apart, and have a space of 9 ft. on each side of the stem for fan expansion.

The methods of constructing trellises vary, and mostly according to the experience of growers, and many types are employed in the different districts. The writer having considered this matter from every aspect, would recommend one of the following dimensions:—Trellis, 6 ft. high, end posts 8 in. x 8 in., with 3 ft. 6 in. in the ground, and "stayed"; others 6 in. x 6 in., and 2 ft. 6 in. in the ground; five 10-gauge galvanized iron wires, 18 ft. between the posts, and the trellises 12 ft. apart.

To find and peg-out the exact positions which the vines are to occupy when planting is done before the trellises are erected, the following method may be observed:—Place the first or corner peg 29 ft. from the end and 12 ft. from the side fence; then complete the first row by placing the pegs 18 ft. apart, as explained in connexion with the erection of the posts. Then the pegging-out of the plot may be completed by putting in parallel rows of pegs 12 ft. from each other. Where there are no fences, or where those on the land do not describe a right angle to serve as a guide in planting, a right angle may be set out by adopting the 3, 4 and 5 principle so often illustrated and explained in articles in the *Journal of Agriculture* by the orchard experts of the Department.

Planting-out is usually done between the end of September and the beginning of November, according to the conditions prevailing in the different localities, and when the frosts are over. The holes should not be made deeper than the soil has been cultivated, for the obvious

reason that basins formed in the subsoil may collect and retain surplus water, which is injurious to the plants. In planting the vines should be placed at the same depth as they grew in the nursery, and at this time the advantages of the planter having raised his own vines will

A B

Fig. 5.—Stakes Supporting Young Vines.

be amply apparent. The holes should be sufficiently wide to permit of the roots being made to radiate naturally before the soil is filled in. When pegs are used to mark the correct positions for the vines, a planting board should be employed to ensure that the plants are

accurately placed in those positions. The construction of the planting board and method of using same have also often been depicted and explained by the experts.

The vines are usually planted out when one or two years old, and then supported by stakes until trellises, with four or five wires, are erected. Should trellises constructed with three wires only, as shown in Figure 4, be in position prior to planting, stakes are also used to conduct the vines on to the wires, the lowest of which is further from the ground than when four or five are employed.

Figure 5,A. shows a two-year-old vine in position awaiting the erection of the trellis. This is the method adopted by Mr. P. S. Chipperfield and most other growers in the Silvan district, and it has proved highly satisfactory. Success also accrues to Mr. J. Briggs' mode of treating the young vines. Here the seedlings, when one year old, are transplanted from the beds or drills into rows 3 ft. apart, with 1 ft. between each two plants in the row; then one stake is used to support each pair of vines until two years old, as shown in Figure 5,B. The seedlings in the illustration were photographed just prior to their being planted out. Mr. Briggs raises his own vines, and his method of planting is as follows:—The stake is drawn out, and each plant is carefully lifted, with its roots and soil intact. In this way growth is only slightly retarded, whereas when vines—particularly two-year-olds—are introduced from another nursery or district, they usually suffer considerably in transit. Tests were made when planting by placing the passions in pairs, but this method proved unsatisfactory, and was abandoned in favour of the single vine.

VI.—Tying up the Vine and Arranging its Branch System.

When the vines are planted out, and the trellises erected in the manner explained, the next operation requiring attention is tying them up on the wires, and when planted 12 ft. x 18 ft., as shown, there are 200 plants per acre to be handled. The desired symmetrical appearance and future stability of the vine's superstructure largely depends on how it is treated at the tying-up. This part of the work should, therefore, be done in a scientific and systematic manner and on the most approved lines. It should be generally understood that the passion, like the grape vine, produces tendrils which during their development take hold of branches, laterals, wires, &c., with which they come into contact, and are not easily detached when growth ceases and the tendrils become dry and hard. Now the advantages which follow the proper spacing and directing the leaders of the vine on the wires prior to the development of the tendrils will be easily realized. Strips of the green leaves of New Zealand flax (*Phormium tenax*) and binder twine (made from the fibre of the same plant) are generally used in tying up, and the bands should not be made too tight, as the leaders require sufficient room for natural expansion. Bands are tied at each point where the leaders come into contact with the wires, and sometimes, also where they touch the wooden droppers, or the vertical wires occasionally employed to afford further support to the vines and strengthen the espalier.

The sketch in Figure 6 shows the mode of strengthening the trellis, and depicts four methods of trellising vines. It is desirable to keep the wires constantly tense and the framework rigid, because a freely

vibrating trellis is not conducive to the growth of passions. Seven to nine saplings about three-quarters of an inch in diameter, are employed to stiffen that portion of the trellis occupied by each vine, and these are woven about 18 inches apart, one against the other, into the wires, on the principle of wicker-work, as depicted at (*a*) in section A. Here also is the figure of a young vine which may be regarded as one or two years old, according to its development prior to planting out and the amount of attention bestowed on regulating its branch system of six leaders; and (*b*) shows the formation of the plant a year or two later, when the number of main arms have increased to twelve; while (*c*) with sixteen leaders, illustrates the fully developed vine of, say, five or six years old, and occupying the whole of the section of espalier assigned to it. It is not suggested that the main arms can be made to radiate from the crown as accurately as the lines drawn here to represent them, but the writer would invite experienced growers, as well as intending planters, to accept this as the most modern and approved plan, and in trellising their vines to imitate it as closely as they can.

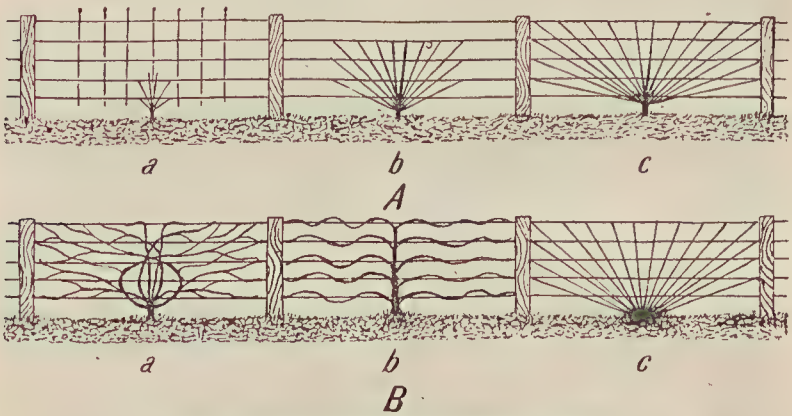


Fig. 6.—Four Methods of Trellising Vines.

The type of vine recommended has a single stem, about six inches long, and only the main arms are shown. These give out numerous light laterals on which the fruit is produced. In order to maintain healthy, vigorous growth, with a view to producing fruit of the finest quality, as in the case of fruit trees (apples, pears, peaches, &c.), most of the laterals should be removed at the pruning. This can be much more easily accomplished when the leaders assume the positions shown and are made firm, than if allowed to become twisted into objectionable shapes, as so often happened during former years. The condition of affairs in recent years, however, has been much more satisfactory because of the growers' losses, due to lack of attention in this regard, and their having had ample time to make a calm survey of the position.

Three other methods of trellising are depicted in section B—(*a*) shows a rather nice type of vine with single stem, and it will be observed that the two outside leaders are drawn up from the crown so as to describe a circle, cross each other at the centre wire, and then incline in opposite directions to the top corners of the espalier. Two other leaders inclining more to the vertical, cross each other higher up,

Fig. 7.—Three-year-old Vine prior to being tied up.

and again rise gradually to the top wire. The next pair of leaders rising from the crown describe such an angle to the vertical as to leave the usual space for the centre dropper. The fourth pair of leaders strike out almost horizontally, and are supported by the bottom wire as shown. Now it will be seen that the vacant spaces on the trellis are fillled in by sub-leaders, or side arms, growing on the main branches.

The mode of trellising passions shown at (*b*) has been practised only to a limited extent. This consists of bringing the main stem up to the top wire, and during its growth twisting the horizontal arms, produced from suitable nodes, around the wires and tying them in position. From what is known of this method it cannot be recommended, as the side arms rarely make uniform growth, indicating that a less equal distribution of sap is maintained through the centre stem than obtains when the leaders radiate from a crown. This method is largely resorted to in trellising grape vines. Pears are worked in this way at the Burnley School of Horticulture; and Mr. Tom Sebier, of Wandin, has several Burbank plums treated similarly, and these yield heavy crops of fruit.

In (*c*) we have the most undesirable formation. Here, instead of a single stem, the necessity of which has been previously emphasized, the leaders constituting the fan or framework of the vine are allowed to come from below the soil level. This type is of common occurrence, but should neither be planted nor grown, as it is practically impossible to keep the butts of the leaders free from fungi, and possibly deleterious soil acids, and particularly where wet soil conditions exist. Many vines of this formation have died through the rotting of the bark under the soil, even where no fungous organisms were found. There are other methods of trellising, and many modifications of those illustrated, but the one depicted in section A typifies, as far as the writer has been able to determine, the best and most practicable style for general adoption.

The young vine should be tied up as early as possible, so that its first produced tendrils may be utilized in clasping the wires, which offer support, and facilitates its systematic construction and satisfactory development. The plant appearing in Figure 7 is three years old, and although some are supported by the stake, most of its leaders are lying on the ground, having produced and expanded their tendrils to no advantage. Here also is seen the method of using vertical wires in lieu of wooden droppers to strengthen the trellis, which in this case consist of three horizontal wires, though at least four should be employed, as the bottom one is much too high from the ground level. When not placed on the wires until the condition shown here is reached, the vine's subsequent development and general make up are rarely satisfactory. As this is such an important factor in passion culture, and so as to obviate faulty construction of the vine, the writer would again direct the reader's attention to the method depicted in Figure 6, section A, and learn that the plant should be trained from the beginning to exert the whole of its energy in the right direction.

In Figure 8 are given photographic illustrations of eight-year-old vines, depicting two of the classes of stems to which reference has been previously made. A shows a single stem with leaders striking off from the crown six inches above the ground, but this cannot be regarded as the best type of its class, as a sufficient number of main

arms, sub-leaders and side shoots have not been encouraged to complete the framework. The required number of leaders may easily be obtained from the crown if judicious pruning be practised during the first few years of growth; but, like most kinds of fruit trees, the leaders become bare of fruit wood below if allowed to produce too many side arms or shoots above, as may be seen by the picture. The leaders are sometimes cut hard to remedy this defect, and good growths are often produced, but the resultant framework is rarely as substantial or the vine as fruitful, as when properly trained at the beginning. B is one of the class which establishes itself by throwing up two or more leaders from below the soil level, and for this reason is afterwards subject to the disadvantages previously mentioned. Vines of this type are rarely selected for planting. What usually happens is that after being planted out the seedlings are cut down by frost, causing numerous suckers during the following period of growth to come from that part of the stem immediately above the root systems. Then instead of

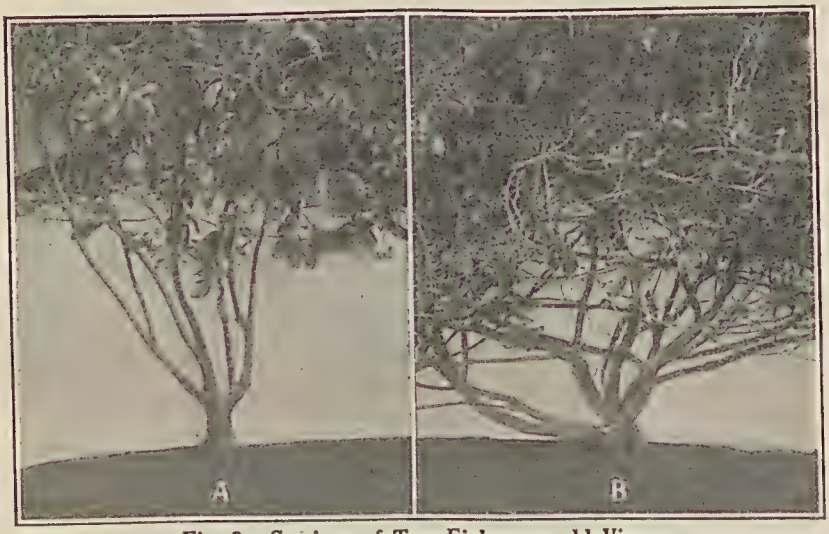


Fig. 8.—Sections of Two Eight-year-old Vines.
A shows the approved stem, and B the objectionable one.

selecting one of the most suitable of these growths for a single stem, and keeping the others suppressed until the basal buds die out, all the growths are allowed to remain, causing extra labour and anxiety not experienced in treating the single stems. The specimen under review has three stems, but is nevertheless a healthy and productive vine. This part requires more care and attention, however, because of the disabilties explained than the single stem. The fungous organisms, or lowly forms of vegetable growth which attack the roots and stems, as well as those which affect the foliage and young growths, thrive best in moist shaded situations. It is therefore advisable, if at all practicable when planting, to run the rows north and south so that the morning sun may shine on the east side of the trellises and on the west side in the afternoon.

Many kinds of vine supports, such as wooden frames, upright posts with cross-pieces, lattice-work, &c., tried in the past and proved unsatisfactory, have been abandoned in favour of the wire espalier.

Experiments are being carried out, however, to further test the efficiency of modified forms of the wire trellis, and these methods—two of which are illustrated here—are being tested in Mr. A. Baker's orchard at Wandin. One of these consists of a row of rough split

Fig. 9.—Experimental Trellising.

4 ft. posts 12 ft. apart, along the tops of which two parallel wires are fastened two inches apart. A four-foot stake between each two posts conducts a single stem vine to the wires, along which the leaders are trained, as shown in Figure 9. In the other type the posts are longer, and a twelve-inch cross-piece of 2 in. x 1 in. hardwood is nailed four

feet from the ground to each post. The cross-piece supports two parallel wires in saw-cuts ten inches apart as may be seen in Figure 10. Stakes are used in this case also to guide the vines to the wires, on which the branches are placed similarly to those in Figure 9. As the

Fig. 10.—Experimental Trellising.

vines develop and the leaders creep along the wires, the fruit laterals will be suspended beneath, and the results of this method of trellising in Victoria will be watched with interest.

(To be continued.)

SUCCESSFUL DAIRYING IN GIPPSLAND.

By W. J. Yuill, Dairy Supervisor.

Sixteen years ago, "Blossom Flat," situated in a bend of the Latrobe River, 5 miles north from Morwell, was a wilderness of swamp gum, tea-tree, sedges, rushes, and weed pests, such as may be found on most unimproved and neglected farms. To-day it is a comparatively clean, and high-producing property.

The history of the success of Messrs. Howlett Bros., the present owners, is worth recording, because the system followed by them, and the success attained, can, to a greater or lesser degree, be repeated by many dairymen working under similar conditions.

The statement that any one can be a dairyman is, in a measure, correct, only needing the qualification of sufficient capital to commence operations, and ability to milk the herd. But to be a successful dairy farmer requires the further qualification of ability to successfully direct every effort, and make the farm a payable business proposition.

The owners of "Blossom Flat" have built up their dairy farm on sound lines, and probably in no other district could there be found two more satisfied and optimistic dairymen. It may be said that with such land and cows, this may well be so; yet their present position is but the outcome of sustained effort and intelligent work.

They state that when, in 1906, they rented this 140-acre property for three years, with the option of purchase, the value represented in their stock, implements, and cash did not exceed £250; and that their knowledge of dairy farming was also very limited. The cream cheques for the first year's work amounted to £80, and the carrying capacity of the farm was so low that the dairy herd of seventeen head, with their calves, had to be pastured elsewhere for several months to save them from starvation.

Owing to a considerable area of the farm being lower than the river bank, this was left, after each flood, covered with water, which remained until it slowly evaporated or soaked away. In these backwater areas, driftwood collected, and a growth of water weeds and rushes was encouraged, leaving them sour and of little value for grazing purposes. This was quickly recognised as the first obstacle to be overcome, and a system of drains was laid down, these varying in width and depth from a few inches to several feet, and sufficiently extensive to give even a casual observer some idea of the difficulties which had to be faced.

So successfully was their work of drainage carried out, that the farm is now entirely free of water within a few days after any flood in the river has receded. The whole of farm was thus gradually brought into working order, and is now carrying a splendid sole of rye, together with many species of introduced clover, including Dutch White (*T. repens*), Alaske (*T. hybridum*), Red (*T. pratense*), Cluster (*T. glomeratum*), Subterranean (*T. subterraneaum*), Perennial Strawberry (*T. fragiferum*), Birdsfoot (*Lotus major*); also several of the native trefoiliums; while *Paspalum dilatatum* also flourishes. On no other farm has the writer seen so much value placed on the clover in the pasture, or so much care given to its cultivation.

After working the property for a number of years, it was considered that better results could be obtained by working from two centres.

The farm was therefore divided—sheds and dwelling being erected on the 80 acres now owned by Mr. E. H. Howlett; and the front 60 acres was retained by Mr. Harry Howlett—both farms being considered to have an equal carrying capacity.

Top-dressing the pasture has been proved to give excellent results on even the richest river flats. Mr. E. H. Howlett also top-dressed a paddock of paspalum and birdsfoot trefoil, which he cuts for winter feeding. This paddock, after being top-dressed with a bag of superphosphates to the acre, gave twice as much hay as in any previous year, and the growth of trefoil greatly increased. A lime and manure spreader has recently been purchased in order that top-dressing the pasture may be more effectively carried on. Mr. Howlett always finds time to go over the paddocks after the first rains in autumn, and again in the spring, with a leveller, arranged so as to break up all the manure from the stock

Four of the Leading Cows in Mr. H. Howlett's Herd, sired by Cobra.

Their average for 273 days under official test was 7,917 lbs. of milk and 368 lbs. of butter fat. Testing proves Cobra to have been a wonderfully prepotent sire.

and spread it more evenly over the land. Some shelter is provided; but it is intended to give more attention to this matter in the future.

The cows were rugged this winter for the first time, with satisfaction to the animals and the owner.

Mr. E. H. Howlett is well known throughout the district for his advocacy of the Jersey breed. He has recently purchased some pure-bred cows of noted show-ring and utility strains, and also a pure-bred Jersey bull from the "Banyule" Jersey stud. This bull is "Duke of Banyule," a son of "Milkmaid's Chief," and is out of "Mary Ann of Banyule," a cow which yielded 441 lbs. of butter-fat on her second calf.

The average yield on this farm last season was 250 lbs. of butter-fat, according to the factory returns, although the herd included eight three-year-old an six two-year-old heifers. When four months in milk, the three-year-olds were averaging nearly 10 lbs. of butter-fat per week, and the two-year olds 8 lbs. of fat. For the previous year, the herd averaged £26 8s. 2d. per head, half of the herd being two-year-old heifers.

With the exception of the paspalum and birdsfoot trefoil hay, no other hand-feeding is given. At the time of my visit, all the stock on the farm were being liberally fed on this, which, apparently, was quite relished, as no waste occurred.

After seeing the Yinnar Testing Association at work on his brother's farm, Mr. E. H. Howlett is of the opinion that the yearly subscription is money well invested; and his herd is now entered in this Association.

Mr. Harry Howlett's farm is unique, in that an area of 60 acres supports the owner and a share farmer, who does all the dairy work. Thirty-five cows were milked last season, and their records of milk from daily weights, and the butter-fat estimated from the official monthly test of the Yinnar Herd Test Association is given on page 22.

All the feed supplied to the herd was grown on the farm (with the exception of half a bag of bran, which was fed to Melba, the best producing cow, during the last month of the season). Eleven acres of maize was grown, and this, together with the splendid pasture, maintained the milk flow until late in the autumn. As a result, the herd, including seven two-year-old and five three-year-old heifers, averaged £14 8s. for butter-fat, or £8 4s. per acre for the year; while the gross return from the farm, not including the value of the young stock, was £12 13s. 6d. per acre. The gross return from this 60-acre farm for the preceding year, when 30 cows were milked (as shown in the income tax return), was £987.

During the year, the leading twenty cows average 6,258 lbs. of milk, and 297⅓ lbs. of butter-fat. The best cows gave 8,152½ lbs. of milk, with an average test of 4.91, and 400 lbs. of butter-fat. The leading two-year-old heifer "Ruby" produced, in 236 days, 4,879 lbs. of milk, with a 4.88 per cent. test, and 238 lbs. of butter-fat; while four of the three-year-old heifers are among the twenty best animals in the herd. Some of the heifers calved late, and did not complete a full nine months by the time the Association's year closed; otherwise the figures of some of them would have shown to still better advantage, some having averaged over 1 lb. of butter-fat daily while being in the test. The highest and lowest monthly test of each cow is given herewith, and is an illustration of the futility of using a single test to determine the

View of Mr. H. Howlett's Milking Herd. Homestead and milking-shed in the distance.

Some of Mr. H. Howlett's Milkers, showing type and constitution.

value of a dairy cow. The wide variation of these tests should point conclusively to the folly of including or rejecting any cow on a single test, which practice is sometimes followed. Nothing but a series of tests to determine the average test is of any value, and this knowledge does not make us much wiser concerning a cow's actual value without we have a record of the amount, or weight of milk for the period.

The two-year-old and three-year-old heifers on both farms are by "Merrygirl's 4th son of Melrose," ex "Merrygirl the 4th," sired by the famous imported Jersey bull "Pretty Noble." There is more than coincidence in the fact that the only four daughters now on this farm of a bull named "Cobra" (also by a Woodmason-bred bull) are among the five best cows of the herd; while the two leading cows on Mr. E. H. Howlett's farm carry the same line of blood. The exceptional merit of these two bulls is now appreciated, it having been clearly demonstrated by the test record. All stock are dehorned before coming into

Mr. E. Howlett's "Pet" Family—all proved producers, showing the advantage of breeding from a cow known to be dominant in milking character.

the milking herd, and with the horn appears to go the fighting spirit, for there is practically no trouble, either in the milking yards or while the cows are being hand fed; udders damaged by horns are consequently unknown.

Undoubtedly, the splendid condition of the pasture is one of the main factors in the high production of these herds. It is too often forgotten that the feed nutrients contained in grass from such pasture land are those considered by the agricultural scientist to be the most suitable for milk production; and also that the ratio of proteids to carbohydrates in it conform to the accepted standard of a balanced ration. Mixed pasture containing a large percentage of clovers is

ideal feeding, and to this may, perhaps, be added the highest degree of palatibility and digestibility present in any fodder.

While Messrs. Howlett Bros. are keen supporters of the Jersey cow, they are under no delusion regarding the fact that unprofitable cows

A View of Mr. E. Howlett's Flats, where clover is abundant as a result of top-dressing.

"Melba," Mr. H. Howlett's best producer. Her official figures for November last were 52 lbs. of milk, 4·6 test = 2·39 lbs. of butter per day.

are to be found in their fancy breed. This is the reason why they are practical advocates of the District Herd Testing Association. In a simple, although unorthodox, way they have been herd-testing for

years, and undoubtedly their present high-producing herd is, in a measure, due to their efforts in that direction.

The Association system of herd testing is making considerable progress in Gippsland; and there are dairymen who see in it their ultimate salvation.

It will be well to remember, however, that any other part of the dairy farmer's work, *except the feeding of the cows*, will withstand neglect for a time without immediate loss to the owner. Good cows we must have, better bulls are essential to progress, and testing is only a common-sense business principle; but any departure from good feeding will immediately show itself in the monthly returns. A poor cow on good feed may even become more profitable than a good cow on poor feeding. Three years ago, there came under observation a dairy herd which averaged 98 lbs. of butter-fat per cow for the year. This was not because the cows could not produce more, but because they were only

"Pet," Mr. E. Howlett's leading cow, showing dairy type and constitution; now twelve years old, but still one of the best producers on the farm.

half fed. Half rations are fatal to production. It would almost seem that some farmers fear that their cattle will suffer from over-feeding, as with a race horse, so much care appears to be taken in keeping them in a lean and racy condition.

Messrs. Howlett Bros. know well that good, liberal feeding is the foundation of successful milk production, and the whole of their efforts have been given to keeping their cows fully supplied with all the fodder that they can eat at all times, just as they would in good pasture in the flush of the spring.

By their industry these two men have turned a wilderness into a most productive farm, and they are still working for the further improving their herds and farms. Opie, the eminent English painter, when asked what he mixed his paints with, replied, "With brains, sir." Intelligence is just as necessary in conducting a successful farm as in

painting a picture. Acres, cows, and sheds may constitute a dairy farm, but if success is to be achieved, "brains" are required to direct the brawn and properly handle each part of the work. The results obtained on each of these farms discussed are better than from many herds where liberal feeding of concentrates is practised. This goes to prove the thoroughness of their working methods, and shows that they are worthy of emulation.

A careful study of the figures given below will be worth while, as they provide much food for study. The greatly increased value of the holdings, and the present splendid cash returns received, are the reward of the hard but effective work in the early years of draining, clearing, and subsequent attention to the details of feeding and general farm management. To these do the Messrs. Howlett Bros owe the satisfactory position that they hold to-day.

MR. H. HOWLETT'S HERD TEST RECORD.

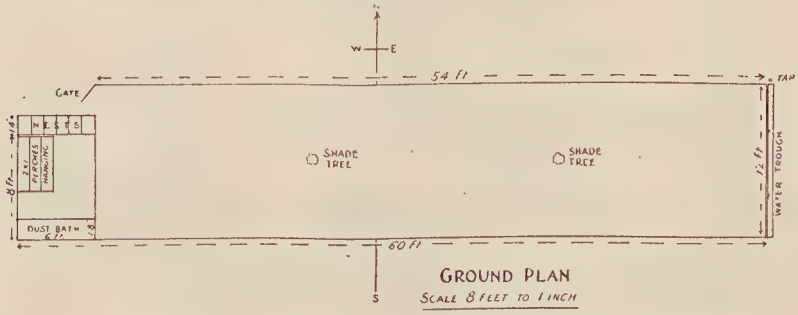
Name of Cow.	No. of Days in Test.	Lbs. of Milk for Period.	Composite Test of Period.	Highest Monthly Test.	Lowest Monthly Test.	Butter Fat for the Period.
Melba ..	273	8,152½	4·91	5·7	3·8	399·86
Blossom ..	273	8,192½	4·56	5·9	4·2	373·79
Beauty ..	273	7,799	4·18	5·4	4·3	356·54
Mabel ..	273	7,363	4·51	5·4	4·2	332·55
Clara ..	273	7,517½	4·40	5·8	4·3	330·86
Dusky ..	273	6,095½	5·30	5·8	4·3	325·64
Jessie ..	273	5,670	5·40	6·3	4·0	306·50
Countess ..	273	6,192½	4·93	5·5	4·4	305·66
Star ..	273	6,843½	4·34	4·9	3·7	297·38
Trilby ..	273	8,025	3·65	3·9	3·3	291·83
Elaine ..	273	5,695	4·98	5·7	4·0	283·38
Laurel ..	273	6,015	4·71	6·0	3·2	283·57
May ..	273	5,898½	4·54	5·1	3·8	268·56
Daphne ..	273	5,751	4·65	5·6	4·1	267·41
Myrtle ..	236	5,981	4·37	5·0	3·7	261·65
Lou ..	236	5,171	4·97	5·9	4·3	256·55
Violet ..	243	5,123½	4·99	5·5	4·1	255·48
Bonnie ..	264	5,040	5·00	5·3	4·6	251·36
Lovely ..	243	5,343	4·68	5·3	4·3	250·80
Biddy ..	236	4,795	5·14	6·4	4·2	246·37
Ruby ..	236	4,879	4·88	5·3	4·3	238·18
Tot ..	244	4,708	4·12	6·0	4·0	227·85
Amy ..	225	4,144½	5·10	5·8	4·1	211·88
Bud ..	225	4,355	4·80	5·9	4·1	208·96
Dulcie ..	203	3,249½	5·60	6·0	4·1	182·17
Ivy ..	203	4,422½	4·67	4·9	3·9	181·61
Flower ..	215	3,553	4·75	5·6	3·8	168·80
Annie ..	210	3,235	5·10	5·7	4·7	165·37
Dolly ..	123	3,345½	4·84	5·3	4·7	162·52
Winsome ..	181	2,926½	5·00	5·8	4·1	146·88
Comet ..	89	2,196	4·35	4·7	4·1	95·34

POULTRY HOUSE.

WHICH MAY BE USED AS A BREEDING PEN.

By W. C. Rugg, Poultry Foreman, Werribee Research Farm.

The class of breeding pen illustrated below would be found suitable for housing up to twenty layers. Such pens have proved very satisfactory at the Werribee Research Farm, and they may be inspected there at any time by appointment.



Plan of Poultry House and Yard suitable for Breeding Pen or to House Twenty Layers.

Material Required.

If desired, such a house may be built simply. The material required is as follows:—

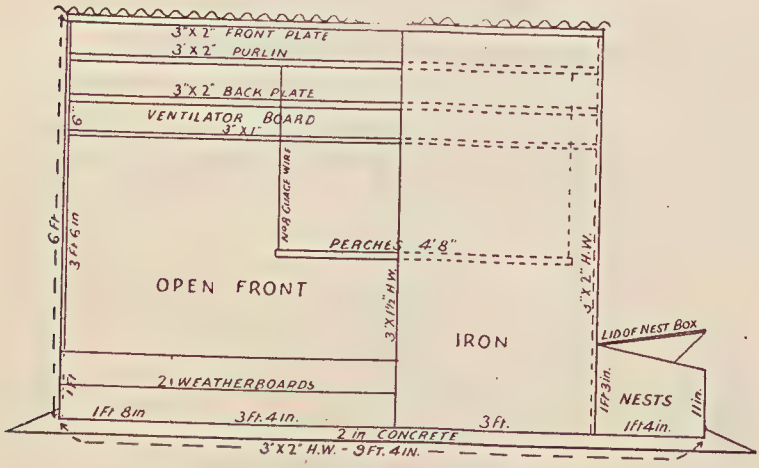
Size of house—8 feet by 6 feet, 6 feet high in front, 5 feet at back.
Blocks—4 x 4 red gum.
Floor—Concrete, 2 inches.
Bottom and top plates—3 x 2 hardwood.
Purlin—3 x 2 hardwood.
Corners—3 x 2 hardwood.
Studs—3 x 1½ hardwood.
Battens—3 x 1 hardwood.
Perches—2 x 1 hardwood.
Ventilator—Weatherboard pine.
Lid of nest box—Weatherboard pine.
Back and ends—Plain galvanized iron, 26 gauge.
Roof—Corrugated galvanized iron, 26 gauge.
Nests—Kerosene or petrol tins.

Method of Building.

If frame is built, and the iron put on inside of the back and sides, very little harbour is left for vermin to breed in.

A portion of the front (a width of three feet) is enclosed with a sheet of iron 6 ft. x 3 ft. The remaining five feet is boarded up one foot, two weatherboards being used so as to confine the scratching material and prevent waste.

A dust bath is constructed by fixing a piece of corrugated iron 6 ft. by 1 ft. on edge, eighteen or twenty inches from the wall furthest from the nests. In this should be placed from six to eight inches of sand and ashes. The rest of the floor should have six inches of scratching material spread over it.

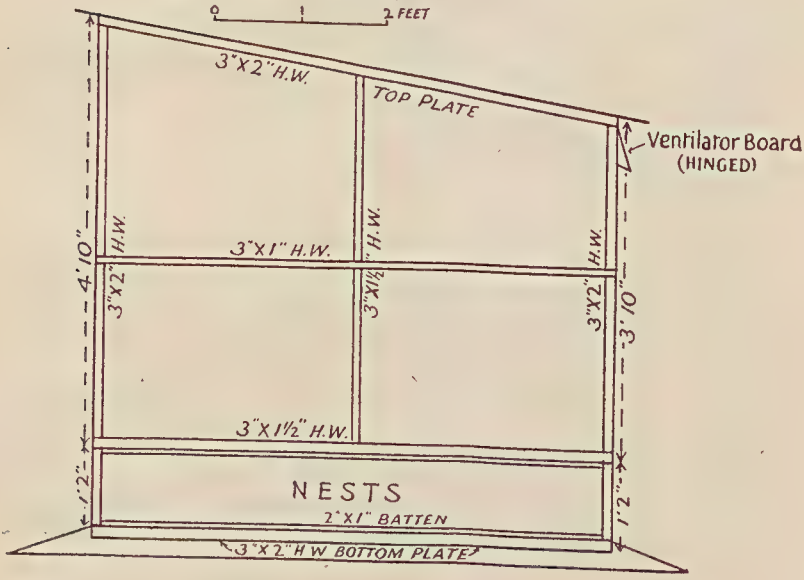


FRONT ELEVATION

0 1 2 FEET

BACK FRAME

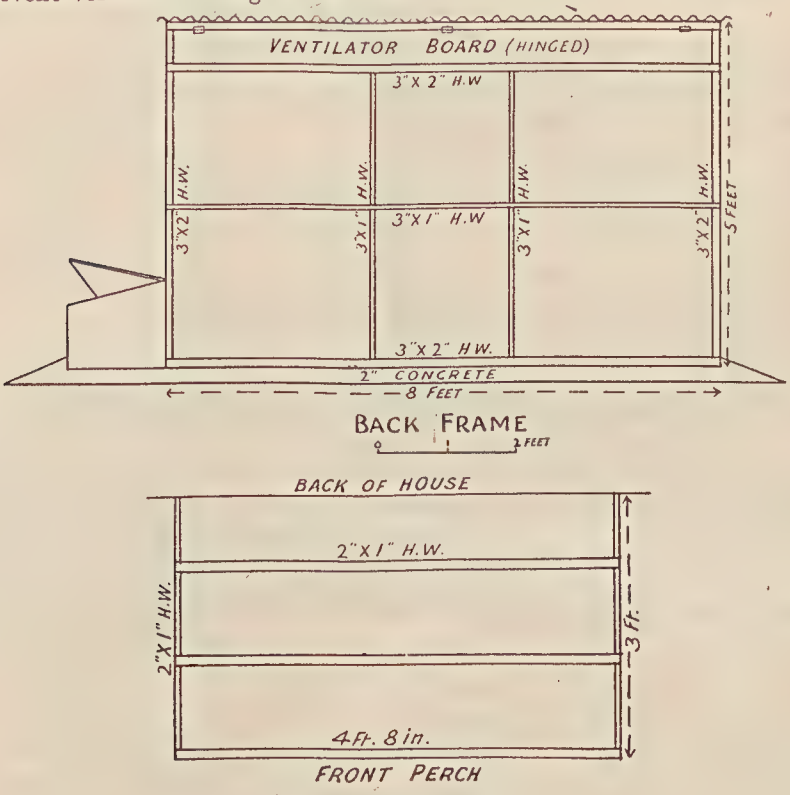
0 1 2 FEET



NORTH-END SECTION

0 1 2 FEET

The perch frame shown in the sketch is large enough for twenty birds, and if suspended from the roof 2 ft. 6 in. from the floor by four pieces of wire, there will be no obstruction on the floor to broom or scraper used by the attendant when cleaning the house. All perches should be at the same level, and not less than two inches wide, and they should be removed at intervals and painted with kerosene, to prevent vermin breeding in the crevices.



Roosting Frame.

This should be suspended from the roof by a piece of No. 8 fencing wire passed through holes at each of the four corners, so that all perches may be on the same level. The two projecting ends are to prevent the perches swinging against the back of the house.

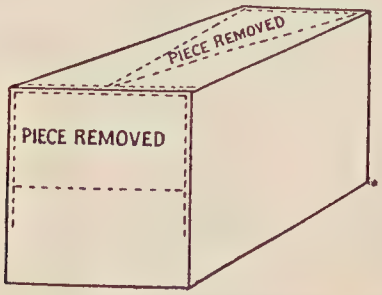
The frame may be made from 2 in. x 1 in. hardwood battens. It should be given two coats of hot tar; this will fill up all crevices in which vermin are likely to breed.

Shade for Poultry in Yard.

Shade trees should be planted in the yards. Several varieties have been planted in the poultry yard at the Research Farm, but the most satisfactory one is the boobialla or boobyalla (also sometimes spelt bubeala). Some planted two and a half years ago are now five feet high and as many feet in diameter, and are covered with dense foliage. They are very hardy, and can be pruned to any shape desired. It is necessary to place a guard round them for the first twelve months to protect them from the birds. After that they will hold their own.

A Device for Catching Fowls in the Pen.

A handy implement for catching fowls in the pen can be made with an ordinary rabbit net, a piece of No. 8 galvanized fencing wire, and a light stick. Bend the wire, which should be not less than six feet,



Nest Made from Kerosene Tin for Poultry House.

Cut tin along dotted lines, remove the three-corner piece on the top and bend the rest upwards. Remove the piece at the end and then cut the end down a further 2 inches, and bend this 2 inches over the 2 in. x 1 in. batten shown in the plan of end section.
Six tins will be required.

into a circle twenty inches in diameter, and make the two ends of the wire straight, and fasten securely to the stick, which should be five to six feet long, and then lace the rabbit net to the wire.

With a little practice birds can be easily caught in this net without risk of doing them any injury.

WEEDS AND THEIR ERADICATION.

(Continued from page 670, Vol. XX.)

By H. W. Davey, F.E.S., Orchard Supervision Branch, Department of Agriculture.

Hoary Cress, *Lepidium draba,* L., *Cruciferæ.*

This cruciferous plant, a native of Europe, was probably introduced here as an impurity in seeds, and is now very widely spread throughout Victoria.

It is a hoary, pale-colored plant, with perennial root-stocks (Fig. 51). The stems are erect, with oblong leaves; the upper ones are auricled and clasp the stems, while those placed lower down possess short stalks.

The flowers are white in colour and very small, and are supported on slender hair-like pedicels, that spread out widely from the axis. The flowers on each stem rise to about the same level, thus giving the plant a more or less flat-topped appearance (*corymb inflorescence*).

The ovary develops into a small pod, having a long style, which, apart from its other characteristics, will help considerably in the identification of the plant. Like other members of the cruciferæ, it is a heavy seeder, and in addition to this, small pieces of severed root-stock are able to produce buds, and thus form new plants.

Unfortunately, it is rejected by stock, and frost does not appear to cause any hurt to its seedlings. The plant, therefore, has every chance of becoming one of our worst weeds. It, however, has one weak point—its inability to withstand a deficiency of moisture in the soil.

The first step towards the control of hoary cress should be to prevent it from producing seed, and to take care that portions of its underground stems are not scattered during ploughing operations.

Hand-pulling will check it only temporarily, unless the operation is frequently carried out, as, owing to their nature, the root-stocks cannot be completely withdrawn from the soil—the plants usually breaking off and leaving portions of root-stock behind; these quickly form new buds, from which, later on, stems will make their appearance.

Hoary cress, which has become a serious pest in many wheat-growing districts, is often further spread during cultural operations. In places where it occurs over large areas, it would be advisable to leave the land out of cultivation and under grass, and then to wait for a long dry spell after harvest, before attempting any cultivation. Care should be taken, in the meantime, to prevent any plants from seeding, either by mowing or hand-pulling them.

It is advisable to make certain that the land is dried out to a depth of at least a foot, it should then be ploughed at varying depths, and afterwards thoroughly scarified. If moisture is present in the soil, ploughing operations should be delayed, otherwise the severed pieces of root-stock, scattered all over the paddock, will not dry out, and the weed may become more widely spread than it was previous to the steps taken for its eradication.

Hoary cress thrives best on moist soils, and quickly suffers from droughty conditions, so that the necessary practice of fallowing land

Fig. 51.—Hoary Cress, *Lepidium draba*, L. (Obtained at Werribee, October, 1922.)

for the purpose of conserving moisture is, unfortunately, all in its favour.

Where hoary cress occurs in small, scattered patches, the plants should be carefully dug out and burnt, or they could be killed by covering them with sheets of iron or other material.

Where the latter method of eradication is to be attempted, the plants should first be hand-pulled or deeply hoed out, and the plots of ground previously occupied by them covered over with sheets of galvanized iron or bark, which should overlap sufficiently to exclude all light. It is important to see that any nail holes present in the iron are also covered, otherwise light will enter, and young plants will grow through the holes. Sheets of strong paper, tarred, and held in place by means of stones or earth will answer the purpose.

Weak arsenical sprays applied as often as shoots appear would have the same starving effect on the roots of this plant as would summer cultivations, and, on account of the small quantities of this material necessary to destroy all top growth, it would be less liable to cause injury to the soil than if salt were used as a herbicide, as the latter would have to be applied in fairly large quantities to cause the same amount of injury to the plants as an arsenical spray.

Sprays that exercise what appears to be a selective action, such as iron sulphate or copper sulphate, have been tried against hoary cress present in growing crops, but, so far, not with very much success. These sprays appear to be selective in their action, but the reason appears to be that grasses and cereals, although injured to some extent by them, recover much more quickly from the sprayings, owing to their greater resistance to this injury. This is probably due to their entirely different habit of growth, as cereals belong to the group of plants known as *Monocotyledons,* whereas hoary cress is a *Dicotyledon,* and develops an entirely different root-system from that of cereals. In the case of cereals, their growth is made from the centre, which is largely protected by the outer leaves from the action of the spray, and is less liable to receive injury from this source than the more exposed surfaces of hoary cress and other *Dicotyledons.*

In America carbon bisulphide is sometimes used against hoary cress. The following appears in the *Monthly Bulletin* of the Department of Agriculture, State of California, for February and March of this year:—

> "Small infestations, where isolated, may be eradicated by means of carbon bisulphide—inch holes, about eighteen inches apart each way and sixteen inches deep, into each of which may be poured two ounces of the fluid, then covered."

Hoary cress is proclaimed under the Victorian Thistle Act for the whole State of Victoria.

Hedge Mustard, *Sisymbrium orientale,* L., *Cruciferæ.*

This weed of waste lands is becoming a common plant in cereal crops, and is likely to become very troublesome where it is allowed to seed itself unchecked, as it produces an enormous amount of seed.

The flowers are small and pale-yellow, the seed pods being long and slender and exceedingly numerous (Fig. 52). The pinnatifid

Fig. 52.—Hedge Mustard or Oriental Rocket, *Sisymbrium orientale*, L., showing the large number of seed pods borne by one plant. (October, 1922.)

leaves are stalked and clothed with soft hairs. The plant is an annual or biennial.

It should be hand-pulled wherever it is found growing, and if it is carrying seed-pods the plants should be collected and destroyed by burning. This weed is another introduction from Europe, probably arriving as an impurity in seeds.

Hedge mustard has not yet been proclaimed under the Victorian Thistle Act.

(To be continued.)

OVERSEAS SHIPMENT OF FRUIT.

REASON FOR FAILURES.

Report by Exports Superintendent.

During last fruit export season thirty-nine steamers carried apples and pears (chiefly apples) from Australasia to the United Kingdom.

The results have been tabulated, showing names of steamers, dates of loading, dates of arrival in England, quantities and varieties shipped from New South Wales, Victoria, Tasmania, South Australia, Western Australia and New Zealand, system of cooling on steamers, condition on arrival, result, estimated losses.

Although damaged fruit was delivered from twenty-eight vessels, the percentage of loss in some instances was small, and generally the results may be recorded as:—Twenty-one shipments arrived at their destination in good condition, seven turned out fairly, and eleven reached London with a considerable portion of the fruit damaged and bad.

Comparisons of Size of Shipments—Methods of Cooling—Lines of Steamers—Temperatures, &c.

Nine steamers, which carried cargoes ranging from 84,000 to 170,000 cases (representing nearly 45 per cent. of the total shipments for the season), were responsible for an estimated loss of £209,235, or 90 per cent., out of the total estimated loss of £232,500. (The loss shown represents the difference between the price realized for the good and the damaged fruit. It may be mentioned that when damaged or inferior fruit or meat or butter is on the market, the price for the good stuff is detrimentally affected; therefore, it may be assumed that the actual losses were much greater than shown). Eight of these steamers were fitted with pipe grids in the holds for brine circulation. One steamer had grids in some holds and air circulation in others. In contrast, two other steamers, carrying 82,000 and 91,000 cases respectively, fitted with battery and air circulation, landed their fruit in good condition.

Nineteen of the steamers used were fitted with pipe grids in the holds, five of which carried their fruit well, and delivered it in good condition. The result in the case of five others was "fair and variable," whilst the cargoes of the remaining nine were damaged and bad.

Seventeen vessels were fitted with the battery and air circulation system. Sixteen of them delivered their fruit in good condition, and one shipment was reported "fair, some over-ripe."

Three boats had some holds fitted with pipe grids, and other holds served with air circulation. One of these delivered the fruit in "fair to good" condition, and two steamers landed the goods in "variable and bad condition."

With reference to the five vessels with the grid system that turned out well, one carried a total of less than 3,000 cases, three from 37,000 to 66,000 cases from one port each, and one 50,000 cases from two ports. The five steamers with grid system which turned out "fair and variable" carried from 8,000 to 16,000 cases each, and all from only one port.

In the case of the seventeen steamers installed with the battery and air circulation system, five loaded cargoes ranging from 31,000 to 91,000 cases at one port only. One took a total of 56,000 cases from two ports, whilst the remaining eleven vessels carried cargoes from three and five ports each, totalling from 16,000 to 84,000 cases.

Six lines of steamers, representing twenty-one vessels, carried fruit satisfactorily (nearly all good, sixteen all right, and five good to fair and variable). The aggregate losses were nominal, ranging from averages of from 1½d. to 5½d. per case.

Three lines of steamers, which carried 60 per cent. of the season's fruit, in most instances delivered their cargoes in unsatisfactory condition, the average losses for all the vessels of each line being from 2s. 9d. to 4s. 6d. per case.

Although there was little difference in temperature during loading at Hobart and Melbourne between the successful and unsuccessful shipments, the average maximum temperatures at time of loading in Adelaide was 82.3 deg. Fahr. in the case of successful shipments, and 89.5 deg. with the unsuccessful boats. At Fremantle, the successful vessels loaded at an average maximum temperature of 79.7 deg., and the unsuccessful steamers at 90.3 degs.

Comments.

As most of the very large shipments turned out badly, it might be suggested as a remedy to limit the size of shipments. This, however, is not practicable, as all the available space is required during the shipping season, and with the growth of the trade, if it is given a chance to expand, the tendency will be in the direction of larger shipments instead of smaller cargoes.

To sub-divide the large holds is equally impracticable, as to secure any effective result would often involve the vital construction or arrangement of the vessel, such as the putting in of new hatches, &c.

The remedy within reach would appear to be the installation of the battery and air circulation system in all steamers carrying fruit, but here again difficulties loom up—the cost of doing so. Those with pipe grids installed in the holds are suitable for frozen meat, butter, &c., and are regarded as better for meat than air circulation.

The best likely to be achieved is to improvise means for air circulation with the grid system when fruit is carried. This can be done, of course, with the sacrifice of stowage space, as walls or bulk-heads and chutes would require to be erected inside the holds.

Extraordinary provision for air circulation is already made by the most successful engineers when stowing the fruit in the holds, whether the installation is battery and air circulation or the grid system. An excess of as much as 12½ per cent. of the stowage space is given up to provide ample access for the cool air through all parts of the cargo, and this no doubt is one of the reasons why the rate of freight is higher than it ought to be. Last season it was 6s. per case (12½ per cent. of which equals 9d.). In other words, were it not for leaving this abnormal space between packages, 12½ per cent. more fruit could be stowed, and a corresponding reduction in freight would pay ship-owners as well. Under present shipping conditions, when placing warm fruit straight into the holds, it is essential to stow in the manner indicated, whilst it would not be necessary to anything like that extent if all the fruit were pre-cooled prior to shipment.

If the fruit were received at cool stores on land and packed into chambers at the same temperatures, in large quantities, and in the same manner as on board ship, the results would be no better. Engineers cannot perform impossibilities. When given a large hold of hot fruit they can only do their best, and even then the outcome will be unsatisfactory to all concerned. The varieties of fruit shipped are kept successfully in cool stores in Victoria for much longer periods than is necessary on the voyage to the United Kingdom.

Recommendation.

As shippers are now negotiating for the next season's service, I recommend the Victorian exporters to as far as possible secure separate holds in steamers for Victorian fruit alone. The shippers can then arrange to pre-cool all fruit for such reserved chambers. Resolutions carried at various meetings indicate that all concerned are in favour of proper experiments in order to confirm the advantages of the system. These cannot be satisfactorily carried out on land in small chambers. A large chamber to hold at least 10,000 cases would be required, and the question arises as to who would provide such a quantity of fruit.

As facilities for pre-cooling are not available in all the fruit exporting States, it will be necessary, when stowing, to arrange for the provision of ample room for the circulation of air through all parts of the cargo. The larger the holds, the greater the space necessary for air circulation. In all vessels fitted with pipe grids adequate means should be provided for the circulation of the cool air.

Each and every refrigerated steamer should be fitted with long-distance thermometers or thermographs, or both, so that the refrigerating engineers can be in constant touch with the hold temperatures. In the case of large holds, two or more points would be advisable.

ELMORE CROP AND FALLOW COMPETITIONS, 1922.

Report of the Judge (H. A. Mullett, B. Ag. Sc., Chief Field Officer).

The Elmore Agricultural Society is to be congratulated on having restored the Crop and Fallow Competitions to its prize schedule. The original Competitions lapsed in 1910. Had they been continued regularly to the present time, there is no doubt that a fund of valuable practical information on the best methods of wheat-growing in the district would have been accumulated and distributed boardcast. As it is, the society has the task still in front of it, but a satisfactory commencement has been made this year.

The present report is concerned solely with the crop competition, it having been decided to judge the fallows next March. In all, nineteen crops were submitted for inspection. The following progressive wheat-growing centres in the Campaspe Valley were represented:—Elmore, Avonmore, Runnymede, Corop, Hunter, and Egerton. The visit enabled a critical estimate to be made of the productive capacity of the various classes of soil and of the skill of the individual farmers. But the dry season passed a judgment on the merits of the methods of crop production more accurately than that of any professional agriculturalist.

In short, the well-farmed land produced heavy crops, despite the dry season, but the crops on neglected fallow, or where grown without fallow, were poor. The outstanding lesson of the competition, then, is that it pays to farm carefully. Impressive were the differences between the yields of the best and the worst crops noticed, and great is the task before the Elmore society in its newly-awakened endeavour to level up the farming methods of the district to the standard of the best in it—that is apart altogether from the need for discovery of improved agricultural methods by means of properly conducted experiments which the Elmore society should foster.

The deep loams of the Runnymede district struck me particularly as being highly fertile and naturally productive, without the use of great skill, and readily capable of growing tremendously heavy crops under proper treatment. All the other land of the district, too, is likely to be responsive to the use of improved methods, if not quite to the same degree.

Results.

Mr. T. E. Houlden, of Runnymede, was awarded 97 points and first place for a heavy crop of Graham wheat. The crop was remarkably heavy for the year, dense and regular throughout, level on top, clean underfoot, and comparatively free from foreign varieties and disease.

Alongside, on the same farm, an equally heavy paddock of Federation was noticed. The excellence of the winning crop is undoubtedly due to the judgment and care with which the fallow on which the crop was grown had been ploughed and subsequently tended. The land was thoroughly ploughed to 5 inches deep in July and early August, and then harrowed after rain. Mr. Houlden finds that he is unable to obtain a satisfactory "comb" to harrow down unless his particular soil is ploughed to the depth mentioned. In October the paddock was spring-toothed, comparatively shallowly, and in November

scarified. It remained thus until the following May, when it was re-scarified and drilled. The wheat was sown early in May, after rain, with 65 lbs. of seed per acre and 70 lbs. of superphosphate. The soil was a good red loam overlying clay.

Messrs. B. Dobell and T. Hayes, on the fringe of the Corop District, obtained 92 marks and second place. The variety was Federation, and the soil red clay loam overlying retentive clay. The crop was a heavy one, clean, free from any disease, and was very even. A few foreign heads were noticed.

The land, shallower than that at Runnymede, was fallowed in July and early August to 4 inches deep. It was harrowed immediately afterwards. In March it was scarified, in early May spring-toothed, and then drilled and harrowed during the second week of that month. Seventy-five lbs. of seed per acre was used, with 85 lbs. superphosphate. The rainfall in this locality appeared to have been somewhat heavier than that received nearer Elmore.

Residence of Mr. A. R. Goldie on the Campaspe River, Elmore.

Mr. A. R. Goldie's entry was a heavy crop of Major wheat, grown on a rich black flat bordering the Campaspe River, in the shire of Waranga. Eighty-nine marks were awarded. The crop was tall, dense, and even, but points were deducted for the presence of foreign heads and a few weeds.

The land was fallowed in July to 4 inches deep, harrowed immediately after ploughing, and then disced twice in the spring. Subsequently, it was disced prior to drilling, which took place towards the end of May. Eighty lbs. of wheat per acre were used and 40 lbs. superphosphate.

Other heavy crops were exhibited by Messrs. H. J. Carmody, R. J. Roulston, D. J. Murphy, C. Cunneen, and E. C. Rasmussen. Mr. Carmody's crop of Federation was quite free from weeds, and was characterized by short straw and level top. The fallow upon which it was grown was ploughed early in July and August to 4 inches deep, then harrowed. In the spring it was twice spring-toothed while weeds

were young. Subsequently, it was spring-toothed in front of the drill in mid-June, and then harrowed. Seventy-five lbs. of seed per acre was applied, with a liberal dressing of superphosphate—90 lbs. Points were deducted for the presence of foreign varieties.

Residence of Mr. R. J. Roulston, Elmore.

Residence of Mr. D. J. Murphy, Elmore.

An equally heavy crop was that of Mr. R. J. Roulston. The fallow was well worked and sown with a combined spring-toothed cultivator-drill. Sixty-five lbs. of seed, with 96 lbs. of superphosphate, were used per acre.

Mr. D. J. Murphy's crop of Federation was one of the heaviest seen. It lost points because of the presence of wild oats. The seed, having been obtained from the Longerenong College direct, was comparatively free from foreign heads.

Mr. C. Cunneen's crop was sown on early-ploughed fallow, with 70 lbs. of Federation wheat, and from 90 to 112 lbs. of superphosphate per acre.

Mr. E. C. Rasmussen's Major wheat lost points because of the presence of wild oats and strangers. It was sown at the end of April. Seed at the rate of 70 lbs. per acre, with 1 cwt. of superphosphate was used.

On land somewhat more clayey in character, Mr. J. W. Smith had a short, dense, and pure crop of Federation.

The remaining crops, many of them, though creditable, were lighter in yield. The principal scores on which marks had to be deducted were the presence of foreign heads, noxious weeds, wild oats, and ball smut. Where this latter disease was noticed the penalty was made heavy because it is one that pickling in correct fashion can entirely eradicate.

Details of Awards—Crop Competition, Elmore, 1922.

WHEAT.

Competitor.	Variety.	Yield.	Trueness to Type.	Absence of Weeds.	Absence of Disease.	Evenness.	Total.
Possible Points	.. ..	**35**	**20**	**15**	**15**	**15**	**100**
T. E. Houlden ..	Graham ..	35	19	14	14	15	97
B. Dobell and T. Hayes	Federation ..	31	18	14	14	15	92
A. R. Goldie (No. 2)	Major ..	34	14	13	14	14	89
H. F. Carmody ..	Federation ..	28	15	14	15	15	87
R. J. Roulston ..	Federation ..	28	17	15	14	13	87
J. W. Smith ..	Federation ..	26	19	13	14	15	87
D. J. Murphy ..	Federation ..	31	19	10	12	13	85
C. Cunneen ..	Federation ..	28	14	9	14	14	79
D. H. Adams and Sons	Federation ..	22	19	13	11	13	78
E. C. Rasmussen..	Major ..	27	15	9	14	12	77
A. R. Goldie (No. 1)	Federation ..	24	15	13	11	13	76
R. H. Kerr ..	Major ..	26	18	10	10	12	76
H. O. Streckfuss ..	Yandilla King	25	16	14	9	11	75
A. Dobell and Wright	Federation ..	25	18	7	11	13	74
Dutton and Young	Steinwedel ..	22	19	12	7	14	74
Henry Smith ..	Federation ..	23	16	13	8	13	73
R. Dutton ..	Federation and Currawa	19	15	14	10	13	71
A. W. Bailey ..	Federation and Gallipoli	21	15	12	11	10	69
L. Strawhorn ..	Federation ..	19	17	13	9	11	69

NOTE.—The points for yield represent rather less than 1 point for each bushel per acre. The winning crop was estimated to yield about 12 bags per acre.

Summarizing the Results.

The results of the competition appear to emphasize the value on loamy land in this district of thoroughly tilled fallow as a fundamental preparation for a heavy yielding wheat crop. The heaviest crops this year have been grown in general on fallow which was carefully and deeply ploughed early in the winter, and subsequently well cultivated in the spring and again in the autumn. Where the crops were light, there the minimum of cultivation had been given. Again, there are strong grounds for believing that it pays to grow varieties of wheat which have been subjected to continuous improvement such as is given at the

Government seed stations, and further that it is profitable to fertilize the crop liberally. On the whole the fallow in the district is tilled far less thoroughly than is found profitable for corresponding soils in the Wimmera.

Wheat-Growing at Elmore—Fallowed and Non-Fallowed Crops.

Three main soil types were noticed at Elmore—rich free-working red loams as at Runnymede, occasionally shading off into black flats in the direction of Colbinabbin; shallow clay loams west of the Campaspe River; and more or less refractory soils in the direction of Corop, and again at Edgerton. Each soil requires its own special treatment if best results are to be obtained with wheat. Rich or poor, they must all be carefully fallowed. The non-fallow crop, long abandoned in the Wimmera, is still persisted in for portion of the wheat sown on many farms in the Northern District, which includes the Goulburn and Campaspe Valleys. Sometimes the practice flatters farmers, but on the average it

A Heavy Crop of Federation Wheat (Mr. R. J. Roulston's).

leaves them poorer in pocket than if the whole or even a lesser area of the crop had been sown on systematically prepared fallow.

The non-fallowed crop, besides giving relatively lower returns, may cause a reduction of the yield of the crop on fallowed land, but in such an insidious fashion as to escape notice.

Ploughing is the slowest cultural operation on the farm. The delays caused by ploughing up land immediately prior to sowing inevitably lead to an unduly protracted seeding period, which means reduced yields. Again, a lengthened seeding season may lead to a late commencement of the fallowing for next years' crop, and here also reduced yields.

Of the value of early fallow there can be no doubt. A careful comparison of the yields of the various crops at Elmore with the time they were fallowed shows that the early fallowed crops are markedly superior, and that deduction is again backed up by the results of the cultivation tests at the Rutherglen Experiment Farm in the North-East. July fallow over a seven years' period there is superior to September or October fallow. Some farmers at Elmore regularly get the fallowing

done in July and early August, and there is no reason why every one on well-drained land should not make a special effort to do the same.

Depth of Ploughing.

In the Wimmera, on the friable soils so notoriously difficult to compact properly, it is fatal to high yields to plough deeper than from

Home of a Repatriated Soldier (Mr. Henry Smith) at Hunter.

Mr. Henry Smith's Wheat Crop.

3½ to 4 inches except in a wet year. But at Elmore, on the clay loam at any rate, the position is different. The annual rainfall is heavier than that in the Wimmera, and the soil packs down on old land much more readily.

It is probable that for July fallow the most profitable depth to plough is 5 inches if the soil be deep enough. The results of the Rutherglen

cultivation tests lend support to this view. But when fallowing is delayed till September or October, there does not seem the same justification for reaching such a depth, because, owing to the shorter season and the reduced quantity of rain likely to fall on it, there is some difficulty, even at Elmore, in securing the necessary compaction of the under layers. For October fallow from 3½ to 4 inches may be quite sufficient.

Of course, it is understood that in no case should quantities of the subsoil be brought to the surface. In the Wimmera, however, there are instances of shrewd farmers, finding the soil at 5 inches rich in marl, who have occasionally ploughed deep enough to bring a little to the surface for the purpose of improving the texture and fertility of the upper layers where these were likely to benefit.

Tank-stand, 40-feet high, at Mr. A. R. Goldie's, Elmore.

It has often been suggested that subsoiling, say, to 18 inches, would pay in the Goulburn Valley, but the experience at Rutherglen on soils approximately similar definitely proves that for wheat no benefit whatever results, and therefore that the practice would result in considerable loss.

Working the Fallow.

The treating of more refractory clayey soils will be dealt with in the report of the crop and fallow competition to be furnished by the Shepparton Agricultural Society. In the meantime, the loamy soils may be referred to here. The treatment of a fallow for best results involves

something more—much more—than the killing of weeds and the convenient preparation of a seed bed for the ready germination of wheat. For maximum yields it is important to trap and store moisture in the under layers of the soil over the summer months, and to facilitate the rapid formation of soluble plant food in the soil. The soil quickly loses its moisture if allowed to set firm on top, but the evaporation may be considerably reduced if there is a layer of loose soil some 2½ inches deep on top. A warm moist soil is an active soil. It is one on which weeds germinate readily, and may thus be removed by cultivation, and in particular it is one in which bacterial life and the process of convertion of inert soil particles into soluble plant food is most active. But considerable skill is required in creating and maintaining the layer of loose soil, technically termed the mulch. The fallow should as far as possible be worked in a moist condition, if it is to assume a proper porous texture, of which a certain mellowness readily visible to the practical man is an unfailing characteristic.

Fat Cattle on the Fertile Campaspe Flats at Mr. A. R. Goldie's, Elmore.

Again, while wheat requires a shallow loose soil to germinate in, it must have a firm consolidated under layer for its roots to penetrate if growth is to continue satisfactorily. The ideal fallow on loamy land when viewed in November is one having about two and a half inches of loose mellow soil overlying a firm, moist, level layer of under-soil, previously ploughed to a greater depth but since consolidated.

These desiderata can be secured where the land is fallowed early, then harrowed down immediately it works freely. Subsequent cultivations must be made to a carefully regulated depth which is no greater than 2½ inches. The use of implements with which this cannot be maintained should be avoided where possible. Working the soil when dry should be avoided. The disc, so effective on refractory land and where weeds are bad, cannot be regulated to cut to a shallow depth. The spring-tooth, useful to kill weeds while young and to till the surface, is not of service where the soil contains hard patches. Some implement

between the two mentioned is required for the Goulburn Valley loams. Two that suggest themselves are the Wimmera scarifier, not the usual type of scarifier seen in the district, and the rigid-tined cultivator. The Wimmera scarifier should be invaluable in some sticky black flats seen in the district, and it should be useful also on the red loams. It is an effective weed killer, and an implement with which a firm bottom can be readily created and maintained. A public trial of both these implements should be arranged by interested agricultural societies.

The questions of pickling wheat, wheat varieties, and manurial treatment will be referred to in reports of competition in other districts to be published later.

A WHOLESALE RAT TRAP.

The method of destroying rats described hereunder has been clipped from a Sydney paper:—

Get an old tub, take away the top, and supply its place with parchment or stout brown paper. On this for two or three nights in succession leave a few fragments of cheese, bacon, or other dainty dear to the rat palate. Lean a piece of board against the side of the tub to serve as a ladder, and allow the rats to become thoroughly accustomed to the future trap. After a few days place a brick upright at the bottom of the tub, fill with water to a depth of 6 inches so that the top of the brick is just high and dry, and cut the parchment in slips in such a manner as to give way at the slightest pressure. The first rat that ventures on this falls, of course, into the water, and quickly makes its way to the brick; so does the second; and then ensues a battle royal, accompanied by much squeaking. Now the cry of a rat in distress invariably attracts every other rat within hearing, with a view to a possible meal upon their unfortunate relations. So others quickly share the fate of the imprisoned rats, and large numbers are thus caught.

PERFORMANCE v. PEDIGREE.

So convinced is the Danish Government of the value of performance as distinct from pedigree, says a recent issue of the Journal of the Ministry of Agriculture (London), that in making provision for the award of special prizes for bulls, it was laid down that a bull is not eligible for a Government prize unless records of the performances of his daughters can be produced. The journal quotes the informative statement that before inauguration of milk-recording societies it had already become a general practice to keep bulls for service for a number of years and to judge the bulls by an examination of their offspring.—*New Zealand Farmers' Advocate.*

STALLION REGISTER 1922-23

under the "Horse Breeding Act 1919."

Part III.—Registrations from 17th August, 1922, to 8th December, 1922.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1537	Abbotsford ..	A	Draught ..	McGregor Bros.	Rochester
1431	,, Champion	A	,, ..	C. Elphick ..	Foster
1394	Abbot's Pride ..	A	,, ..	P. Haire ..	Port Fairy
1337	Abdulla King ..	A	Pony ..	E. Stevens ..	Pranjip
1461	Abutilon	2	Draught ..	J. Walder and Sons	Watchem
1430	Admiral Moray ..	A	,, ..	T. J. Keogh ..	Jarklan
1535	,, Sperry ..	A	,, ..	N. Mathieson ..	Waitchie
1344	Advance	A	Light ..	L. C. O. Smith ..	Merbein
1462	Aiken Flower ..	2	Draught ..	J. Walder and Sons	Watchem
1504	Aleconner ..	A	Thoroughbred	G. A. Fairbairn ..	Kerrisdale
1463	Altona	6	Light ..	C. Joiner ..	Echuca
1334	Ambition II. ..	A	Thoroughbred	L. J. King ..	Quambatook
1239	Anchor Boy ..	3	Pony ..	J. Black ..	Winchelsea
1320	Argyle	A	Draught ..	F. McRae ..	Wallup
1345	Athlete	5	Pony ..	J. Lane ..	Warragul
1376	Aztic	4	Light ..	E. J. Lehmann ..	Murrayville
1258	Balnakill	A	Draught ..	R. J. Thompson	Brim
1220	Banjo	4	Pony ..	R. Jukes ..	Maryborough
1514	Baron Alexander ..	A	Draught ..	Miller Bros. ..	Bacchus Marsh
1240	,, David ..	4	,, ..	Mrs. Fitzgerald ..	Allansford
1271	,, Douglas ..	3	,, ..	T. Maddern ..	Blackheath
1221	,, Ettrick ..	3	,, ..	C. Hewitt and Sons	Werrigar East
1346	,, of Dalmore ..	A	,, ..	Jno. McGregor ..	Pakenham
1242	,, Prince ..	3	,, ..	J. J. Quinn ..	Elmore
1204	,, Wattee ..	5	,, ..	F. Nagorcka ..	Tarrington
1241	Baron's Pride ..	4	,, ..	J. J. Quinn ..	Elmore
1243	Baron Star ..	2	,, ..	R. J. Wilson ..	Camperdown
1395	Bell Boy	A	Pony ..	T. Bandy ..	Waubra
1456	Belmont	2	Draught ..	J. T. Poynton ..	Ensay South
1392	,, Chimes ..	A	Light ..	C. S. Walker ..	Swan Hill
1222	Ben Marceline ..	A	,, ..	F. A. Cox ..	Geelong
1373	Benmore	2	Draught ..	A. E. T. Payne ..	Lillydale
1424	Best Vale	A	Light ..	John Cox ..	Benalla
1432	Billy	6	Pony ..	G. Howlett ..	Coburg
1499	Bingen	5	Light ..	Watts Bros. ..	Kamarooka
1481	Black Bolt ..	A	Pony ..	G. Meek ..	Kinimakatka
1433	Blackboy	A	Light ..	F. Stares ..	Longford
1515	Black Imp ..	A	Pony ..	F. M. Orton ..	Murmungee
1292	,, Knight ..	4	Light ..	G. and W. Lord ..	Flynn
1329	,, Rock ..	A	Pony ..	A. Shanks ..	Lake Mundi
1445	Blacon	A	Draught ..	J. Phillips ..	Marcus Hill
1272	Blair's Choice ..	4	,, ..	Keam Bros. ..	Glenlea
1293	Blue Bolt ..	4	Pony ..	A. Philip ..	Nerrin Nerrin
1446	,, Ribbon ..	A	Draught ..	D. McGrath ..	Manangatang
1347	Bobs	3	Pony ..	J. Long ..	Woori Yallock
1333	Bold Alex ..	6	Draught ..	L. J. King ..	Quambatook

* For registrations prior to 17th August, see *Journal* for October and November.

STALLION REGISTER, PART III., 1922–23—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1321	Bold Baron ..	A	Draught ..	A. Gillis ..	Newmarket
1238	,, Douglas ..	3	,, ..	Thos. Thornton	Waaia
1460	,, Jock ..	5	,, ..	J. Bayliss ..	Eaglehawk
1294	,, Prince ..	4	,, ..	G. Ross ..	Mt. Prospect
1336	,, Rowan ..	A	Light ..	F. B. and M. Bingley ..	Mt. Mercer
1244	Bolwalla	A	Thoroughbred	Harris and Dunne	Warrnambool
1482	Bonnie Signal ..	A	Draught ..	W. H. Barlow ..	Wanalta
1396	Boro Sportsman ..	A	,, ..	E. H. Nolte ..	Merino
1259	Bramhope Royal William	A	,, ..	G. Wilson ..	Talgarno
1423	Brigham Shanter ..	A	Pony ..	J. J. Wall ..	Numurkah
1377	Brigham's Last ..	A	,, ..	S. S. Baulch ..	Orford
1458	Bright Bells ..	6	Light ..	S. R. Ritchie ..	Thomastown
1397	Brydon	A	Draught ..	G. H. Whykes ..	Woodside
1416	Buck	A	Pony ..	Dolman Bros. ..	Coleraine
1295	Bushlark	A	Light ..	W. H. Penaluna	Boolarra
1340	Caledor	A	Thoroughbred	W. J. Keys ..	Pyramid Hill
1296	Canary II. ..	4	Pony ..	G. T. Barber ..	Korweinguboora
1245	Capitalist	6	Draught ..	A. K. Urquhart	Hexham
1464	Capshot	A	Thoroughbred	J. G. Davidson ..	Casterton
1516	Carbinet	A	Light ..	W. Falls ..	Fish Creek
1218	Carden	A	,, ..	W. H. Penaluna	Boolarra
1267	Carmichael ..	A	Draught ..	J. A. Pearse ..	Glenrowan W.
1348	Celmar Style ..	5	Light ..	W. Cochrane and Sons	Ballarat
1349	Chenard	5	,, ..	W. T. Carter ..	Coleraine
1297	Clan Fingon ..	A	Thoroughbred	Ned's Corner Coy.	Mildura
1418	Cleverland ..	A	Pony ..	W. McKenzie ..	Warracknabeal
1298	Commodore III. ..	4	,, ..	E. C. Weir ..	Newry
1434	Convincer ..	A	Draught ..	H. Coleman ..	Rupanyup
1435	Coral Style ..	4	,, ..	J. R. Stokes ..	Abbotsford
1465	Count Traquair ..	A	Thoroughbred	T. D. Ryan ..	Tatura
1429	Craig Derby ..	2	Draught ..	A. R. Allan ..	Broughton
1299	,, Eran ..	2	,, ..	Wm. Walter ..	Tatura
1350	Craigmond ..	3	,, ..	A. Kay ..	Binginwarri
1517	Cross in hand Charmer	A	,, ..	F. E. Coster ..	Sarsfield
1500	Crown Derby ..	A	,, ..	W. S. Graham ..	Tongala
1436	Curfew Bells ..	2	Light ..	G. H. Alford ..	Murrumbeena
1351	Cymbrel	4	,, ..	D. Robbins ..	Korumburra
1466	Cymro Bar ..	A	Pony ..	A. Dunn ..	Trawalla
1300	Cyndette II. ..	4	,, ..	C. G. Newton ..	Kilmany South
1398	Cyndetto	3	,, ..	R. Costello ..	Darriman
1339	Dandy	A	,, ..	W. J. Phelan ..	Meeniyan
1425	,, Geordie ..	A	,, ..	T. G. McKenzie	Yarram
1301	,, Jim ..	3	,, ..	W. G. Thorburn	Boolarra
1302	Danie Bells ..	4	Light ..	H. Bechaz ..	Trafalgar
1447	De Wet	A	Thoroughbred	R. Humphrey ..	Cudgewa
1246	Dimboola	5	,, ..	W. Rogers ..	Warrnambool
1352	Dixie Boodle ..	A	Light ..	John Casey ..	Woodend
1417	Doctor Jack ..	A	,, ..	H. Coleman ..	Rupanyup
1247	Domination ..	A	Pony ..	C. T. Lucas ..	Pomborneit
1223	Donibristle ..	A	Draught ..	Trustees of J. G. Wilson	Milawa
1467	Drumore	A	Thoroughbred	John McPhee ..	Merino
1225	Duke	A	Draught ..	E. A. Thornley ..	Hawkesdale
1205	Dumaresq ..	3	Thoroughbred	A. V. Hiskens ..	Moonee Ponds

STALLION REGISTER, PART III., 1922–23—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1303	Duncan Stewart ..	5	Draught ..	J. Fitzpatrick ..	Heyfield
1353	Dunmore's Pride ..	3	,, ..	W. Jones ..	Warrenheip
1304	Earlsan	A	Thoroughbred	H. Maguire ..	Stratford
1206	Eaton Headlight ..	4	Draught ..	E. W. Schneider	Yulecart
1207	Eaton's Pride ..	2	,, ..	G. Gray ..	Branxholme
1393	Eltham	A	Light ..	G. Gill ..	Gre Gre Village
1526	Erigator	A	Draught ..	R. Whinfield ..	Bamawm
1273	Ethelred of Bolobek	3	,, ..	R. Watson ..	Digger's Rest
1483	Ettrick	A	,, ..	A. J. Gordon ..	Violet Town
1419	Ettrickdale ..	A	Pony ..	W. H. Barber ..	Wodonga
1484	Euphorion ..	A	Thoroughbred	P. Travis ..	Chiltern
1437	Excelsior	6	Light ..	Mrs. P. Shipp ..	Richmond
1270	Eye Glass ..	A	Thoroughbred	W. B. Cumming	Camperdown
1274	Factotum ..	3	Draught ..	G. Buckley ..	Wickliffe
1305	Firebrick	A	Light ..	H. Campbell ..	Traralgon
1275	Fitzallan's Model ..	2	Draught ..	A. E. Male ..	Glenthompson
1306	Flashwood ..	5	Light ..	R. Elvis ..	Korweingu-boora
1399	Flying Star ..	A	,, ..	O. Martin ..	Leongatha
1438	Footwork	4	,, ..	Jno. Chapman ..	Ouyen
1354	Foreman	4	Draught ..	E. Morton ..	Drouin
1523	Gay Garland ..	A	,, ..	F. McCrae ..	St. Albans
1260	Galtimore	A	Light ..	F. D. O'Connell	Omeo
1525	General	A	Pony ..	R. Lewis ..	Fawkner
1507	,, Foch ..	6	Draught ..	Ferguson Bros. ..	Swan Hill
1532	,, Gordon ..	3	Light ..	Sharp and Taylor	Glenaroua
1439	Glendale	5	Draught ..	R. C. Gulliver ..	Balldale, N.S.W.
1478	Glengarnock ..	A	,, ..	B. McKenzie ..	Bass
1355	Glyn Lloyd ..	3	Light ..	J. J. Love ..	South Morang
1401	Glynne Loch ..	6	,, ..	R. Costello ..	Gifford P.O.
1506	Glynngariff ..	5	Pony ..	W. C. Morrison ..	Traralgon
1440	Gold Dust ..	A	Light ..	Mrs. M. Birss ..	Stradbroke
1492	Gold Mauritius ..	4	,, ..	C. Potts ..	Murrumbeena
1402	Gwalia Caesar ..	A	Pony ..	A. E. Hoadley ..	South Mel-bourne
1527	Hampton Ben ..	A	Draught ..	P. Zealander ..	Warracknabeal
1356	Hampton's Lad ..	2	,, ..	J. McGuinness ..	Leongatha
1403	Happy Binnia ..	A	Light ..	E. H. Nolte ..	Merino
1374	Herdsman's Treasure	3	Draught ..	W. J. Cobbledick	Undera
1448	Highland Laddie ..	A	,, ..	P. O'Keefe ..	Laceby West
1308	Hillhead Chief ..	2	,, ..	T. H. Peters ..	Lake Bolac
1449	His Majesty ..	A	,, ..	T. J. Burt ..	Cowwarr
1378	Homeward Bound ..	3	Light ..	McCamey and Coto	Tinamba
1400	Honey King ..	A	,, ..	O'Loughlin Bros.	Leongatha
1309	Hover-a-Blink ..	4	Draught ..	J. B. Ferguson ..	Waubra
1310	Humoresque ..	4	Pony ..	A. C. Bayley ..	Willaura
1404	Jack McKinney ..	A	Light ..	D. Moriarty ..	Wee-wee-rup
1468	,, Newton ..	2	Draught ..	T. Healy ..	Kamarooka
1276	,, Southerton ..	2	Light ..	G. George ..	Beaufort
1518	Jet	A	Pony ..	D. H. McConnell	Longford
1261	Jock McCraw ..	6	Draught ..	Williamson and Coghill	Wendouree
1277	John Douglas ..	5	,, ..	V. P. Dahlenburg	Winiam
1469	Jubit	A	Light ..	P. J. Kelly ..	Hinnomunjie
1519	Junot	A	Thoroughbred	N. McDonald ..	Purnim

STALLION REGISTER, PART III., 1922–23—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1358	Justice	4	Draught ..	Sir Rupert T. H. Clarke	"Bolinda Vale," Lancefield Junction
1405	Kelso	A	,, ..	Carty Bros. ..	Nandaly
1470	Keyver	3	Thoroughbred	W. Lang ..	Mitiamo
1209	Khamasin ..	5	Light ..	S. Winter Cooke	Hamilton
1224	King Edward ..	A	Draught ..	J. G. Wilson ..	Milawa
1459	,, Jimmy ..	A	,, ..	J. Henderson ..	Leongatha
1541	,, John ..	3	,, ..	A. Cail ..	Kamarooka
1441	King's Own ..	A	,, ..	John Denham ..	Leongatha
1538	Kintyre	A	Light ..	McGregor Bros.	Rochester
1471	Larrakin	4	,, ..	F. A. Rigby ..	Box 7, Walpeup
1359	Latest Fashion ..	A	Draught ..	F. W. Benson ..	Tarwin Lower
1311	Left Bower ..	5	Light ..	C. J. Piffero ..	Whitfield
1502	Leitch	A	Pony ..	Ferguson Bros. ..	Coleraine
1539	Little Joe ..	A	,, ..	T. & J. McNamara	Omeo
1491	,, Mac ..	3	,, ..	E. C. Henry ..	Berwick
1493	Llang Graeme (imp.)	A	Thoroughbred	O'Brien and Johnston	Cowwarr
1360	Lochaber	4	Light ..	W. Cochrane and Sons	Pootilla
1227	Locksley	A	Draught ..	C. F. Schulze ..	Arkona
1534	Lodestar II. ..	3	Light ..	A. McKinnon ..	Briagolong
1485	Lord Lonsdale ..	A	Pony ..	D. G. Tomkins ..	Coleraine
1509	,, Panic ..	A	Light ..	D. J. Hamer ..	Croydon
1497	,, Trentham ..	A	Draught ..	C. Maher ..	Tatura
1520	Lucknow	2	,, ..	A. Strawhorn ..	Barfold
1262	Lucky Charm ..	A	,, ..	D. Williamson ..	Wendouree
1278	Mac's Fancy II. ..	3	,, ..	A. C. Jorgensen	Katyil
1216	Magic Railway ..	3	Pony ..	Jessie Wilkin ..	South Yarra
1279	Major Again ..	5	Draught ..	H. M. Bywater ..	Balrootan N.
1280	,, Grattan ..	2	Light ..	R. N. Keating ..	Antwerp
1228	Maldon	A	Pony ..	J. E. Sage ..	Somerville
1380	Malt Change ..	A	Thoroughbred	J. M. O'Connor ..	Buchan
1312	Maltstead ..	5	Light ..	E. J. Wright ..	Gormandale
1479	Marama	2	,, ..	E. A. McRae ..	Buchan
1370	Mark	3	Draught ..	J. Curran ..	Traralgon
1486	Marquis Bold ..	2	,, ..	W. Forbes ..	Berwick
1381	Master McKinney ..	A	Light ..	J. W. Keirce ..	Buckrabanyule
1406	Mawallok	3	Pony ..	G. A. Fairbairn	Kerrisdale
1248	McKinney Star ..	5	Light ..	Noel Bros. ..	Terang
1487	Menin (imp.) ..	A	Thoroughbred	H. Alan Currie ..	Burrumbeet
1281	Merri King ..	3	Light ..	L. F. Etherton ..	Broughton
1291	Metal Bells ..	4	,, ..	A. Gillis ..	Newmarket
1472	Mick	A	Pony ..	H. Foster ..	Red Cap
1513	Mimetic	A	Light ..	A. E. Pegler ..	Mildura
1473	Model's Herod ..	3	Draught ..	M. Hutcheson ..	Pine Grove
1531	Monk	A	Pony ..	R. Angus ..	Springvale
1313	Montrae Bold ..	5	Draught ..	E. Don ..	Newham
1215	Moredun Hero ..	3	,, ..	J. R. Mitchell ..	Sandford
1214	,, Ranger ..	2	,, ..	J. R. Mitchell ..	Sandford
1455	More Huon ..	A	Light ..	H. E. Fisk ..	Leongatha
1382	Musko	A	Thoroughbred	W. Studman ..	Lucknow
1361	Narahquong ..	A	,,	H. Garner ..	Yan Yean
1407	Native Prince ..	A	Draught ..	R. McKenzie ..	Woodford
1422	Newton Bold ..	A	,, ..	L. J. King ..	Quambatook
1442	Newton's Pride ..	4	,, ..	H. E. Cuttle ..	Ultima

STALLION REGISTER, PART III., 1922-23—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1210	Noble Glen ..	2	Draught ..	W. Nagorcka ..	Tarrington
1362	Nutshell	4	Pony ..	A. M. Greenfield	Ballarat
1375	Ormond	2	,, ..	D. Rumpf ..	Herne Hill
1229	,, Dale ..	A	Draught ..	Letcher Bros. ..	Donald
1322	Oyama	A	Light ..	A. E. Kay ..	Dean
1282	Palm Leaf ..	2	,, ..	J. A. Dalgleish ..	Stavely
1474	Patrician	2	Draught ..	R. and A. McClelland	Lara
1524	Peter	A	Pony ..	A. J. Missen ..	Woodside
1536	Peter	A	,, ..	J. Abrahams ..	Fitzroy
1480	Pharaoh	3	Light ..	J. D. Patterson ..	Officer
1331	Ploughboy ..	A	Draught ..	P. Donovan ..	Learmonth
1475	Plucky Willie ..	2	,, ..	W. E. Dahlenburg	Pimpinio
1283	Poilu	A	Pony ..	D. L. Goodwin ..	Kaniva
1330	Preble	5	,, ..	A. F. McKenzie	Hexham
1230	Premier Darnley ..	A	Draught ..	Sham Singh ..	Tempy
1249	Prince Baron ..	3	,, ..	Geo. Crabbe ..	Colac
1314	,, Bellinda ..	A	Light ..	O. Lock ..	Thorpdale
1290	,, Denver ..	A	,, ..	H. Bambridge ..	Northcote
1323	,, of Lorne ..	A	Draught ..	E. H. P. Young ..	Congupna Road
1450	Principal	A	Light ..	J. Kosch ..	Byaduk
1408	Punter	A	Pony ..	R. Ready ..	Rutherglen
1363	Quality	5	,, ..	A. E. Callow ..	Ballarat
1420	Queen's First ..	A	Draught ..	Kenyon Bros. ..	Lascelles
1315	Raeburn	3	,, ..	E. J. Fowler ..	Anakie
1250	Red Lion	5	Pony ..	G. H. Whitehead	Minhamite
1251	Referendum ..	A	Draught ..	C. Dew ..	Ferguson
1341	Remus	A	Pony ..	F. O'Byrne ..	Byrneville
1328	Report	6	Light ..	S. Fraser and Sons	Melbourne
1540	Right Royal ..	A	Thoroughbred	John McKinnon	Kongwak
1533	River Bells ..	A	Light ..	Joe Byrne ..	Toora North
1488	Rizzio (imp.) ..	6	Thoroughbred	H. Alan Currie ..	Burrumbeet
1211	Roala	3	Pony ..	B. E. Lyon ..	Coleraine
1316	Robin	3	Draught ..	R. Geddes ..	Lake Bolac
1409	Robin's Pride ..	A	Light ..	A. W. Dawson ..	Meerlieu
1490	Rocket	A	Pony ..	R. M. Whelan ..	Apollo Bay
1501	Roseneath Prestige	2	Draught ..	J. J. Vile ..	Moorwatha, N.S.W.
1231	Royal Bill ..	4	,, ..	W. J. Collins ..	Beulah
1410	,, Derby ..	4	Light ..	G. H. Eastaugh	Auburn
1237	,, Ensign ..	3	Draught ..	A. Gillis ..	Newmarket
1263	,, Fashion ..	4	,, ..	A. J. D. McRae ..	Gre Gre North
1252	,, Prince ..	4	,, ..	J. J. Gleeson ..	Southern Cross
1508	,, Reserve ..	A	Light ..	W. M. Vale ..	Yarram
1324	,, Ribbon ..	A	Draught ..	Jas. Morris ..	Piangil
1264	,, Salute ..	A	,, ..	T. Opie ..	Deer Park
1428	,, Success ..	A	,, ..	W. Elsom ..	Dart Dart
1383	Royalty	6	Pony ..	W. Coé ..	Coleraine
1489	Rysharold ..	A	,, ..	A. H. Hunt ..	Lancefield
1284	Sandy's Fashion ..	3	Draught ..	E. Haines ..	Gerung
1327	Santa Claus ..	2	Pony ..	W. Henderson ..	Grasmere
1253	Scotland's Fancy ..	A	Draught ..	Alexander Bros.	Carlisle River
1285	Scotland's Viceroy's First	A	,, ..	P. B. Miller ..	Katyil
1503	Scotland Yet ..	A	,, ..	E. A. Riether ..	Balliang
1528	Seabound	A	Thoroughbred	G. J. McVean ..	Thougla
1335	Sea Voyage ..	5	Light ..	K. Noonan ..	Redesdale

STALLION REGISTER, PART III., 1922-23—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1510	Shanter's Best ..	3	Draught ..	R. H. Thomson	Kyneton
1232	„ Ghost ..	A	Pony ..	A. E. Cutche ..	Clear Lake
1286	Shepherd Jack ..	3	Draught ..	Jenz Bros. ..	Antwerp
1212	Shepherd's Pride ..	3	„ ..	E. J. Black ..	Dunrobin
1384	Shetland Laddie ..	3	Pony ..	W. B. Irvine ..	Nicholson
1426	Siam	A	Light ..	J. W. Smith ..	Elmore
1521	Silver Cup ..	A	Draught ..	J. McLeod ..	Tongala
1317	Sir Bute	5	„ ..	Clyne Bros. ..	Tinamba
1386	„ Everest ..	5	„ ..	A. Ralston ..	Lucknow
1342	„ Hambletonian ..	A	Light ..	J. H. Uren ..	Kerang
1343	„ Northcote ..	3	Draught ..	Geo. Madden ..	Batesford
1287	„ Soulander ..	A	„ ..	F. H. Jolly ..	Gerang Gerung
1411	Speculation ..	5	Light ..	D. F. Bourke and W. Quinn	Rochester
1269	St. Patrick ..	A	„ ..	A. Shebler ..	Melton
1332	Strathroy	A	Draught ..	W. G. Ballintine ..	Cosgrove
1511	Sunray	3	Pony ..	W. C. Dettmann	Kyneton
1368	Sunstar	A	„ ..	J. T. Unwin ..	Spring Vale
1412	Swimming Belt ..	A	Light ..	W. T. Cox ..	Moolort
1451	Sydney Derby ..	A	„ ..	W. Maloney ..	Mooroopna
1505	Taffy	A	Pony ..	J. D. Moran ..	Dunkeld
1364	Texas Huon ..	4	Light ..	Jas. Calnin ..	Alfredton
1201	The Butler ..	A	„ ..	Helwig Bros. ..	Glenlea
1387	„ Colonel ..	3	Draught ..	McDonald Bros. ..	Mortlake
1444	„ General ..	A	Light ..	D. J. Kendall ..	Footscray
1289	„ Link	A	Draught ..	H. E. Taylor ..	Nullawil
1498	„ Parisian ..	3	Light ..	H. Lidgett ..	Myrniong
1265	„ Premier ..	A	Draught ..	John Roberts ..	Kunat
1452	„ Roster ..	3	Light ..	A. Rodgers ..	Horsham
1476	„ Vanquisher ..	A	Thoroughbred	G. W. Horne ..	Yendon
1365	„ Voyager ..	4	Light ..	A. Magill and Syndicate	Wendouree
1369	„ Yarra Chief ..	A	Pony ..	J. Douthie ..	Woori Yallock
1413	Thornstone ..	3	Thoroughbred	C. Hoysted ..	Glenrowan
1288	Tigo	3	Pony ..	J. Graham ..	Ararat
1366	Tinylights ..	3	„ ..	Miss Z. L. Small	French Island
1421	Tinytown	6	„ ..	Jack Deane ..	North Essendon
1202	Titiroa Baron ..	A	Draught ..	A. Courboules ..	Cape Clear
1453	Togo's Chief ..	A	„ ..	Jno. Heffernan ..	Kononwootong
1522	Tom Almost ..	A	Light ..	W. Merrigan ..	Swanpool
1226	„ Pepper ..	A	Pony ..	E. A. Thornley ..	Hawkesdale
1457	„ Walton ..	A	Draught ..	F. W. Sallman ..	Dimboola
1254	Tommy Dodd ..	3	Pony ..	Boyd Bros. ..	Minhamite
1219	Trelawney Time ..	A	Draught ..	R. H. Larcombe	Mt. Moriac
1338	True Blue ..	3	„ ..	C. S. Maddern ..	Kaniva
1512	T. T.	A	Thoroughbred	C. Thompson ..	Mildura
1255	Unit	4	Pony ..	B. Rogers ..	Mepunga East
1217	Valice Direct ..	6	Light ..	Jno. Pretty ..	Glenhuntly
1233	Valmond	A	„ ..	A. Judge ..	Natya
1454	Venture	A	Pony ..	L. E. King ..	Violet Town
1388	Vin Direct ..	5	Light ..	D. Kennedy ..	Albert Park
1325	Volunteer ..	A	Pony ..	T. B. Waters ..	Corryong
1494	Von Atom II. ..	A	„ ..	J. A. Padgett ..	Berrybank
1427	„ Osterley ..	A	Light ..	R. Forrest ..	Cowes, Phillip Island
1256	Warrigal	A	Pony ..	S. S. Baulch ..	Orford
1213	Wee Key ..	3	„ ..	R. Kirkwood ..	Byaduk North

STALLION REGISTER, PART III., 1922–23—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1529	Wee McGregor ..	5	Pony ..	J. T. Laidlaw ..	Chetwynd
1266	Welcome Lock ..	A	Light ..	J. L. Meagher ..	Moyhu
1367	Welsh Sovereign ..	3	,, ..	J. Dickinson ..	South Dudley
1234	Wenba	A	Pony ..	Jno. O'Keefe ..	Winslow
1257	Whip Voyage ..	3	Light ..	Jno. Peters ..	Cobden
1477	Widgiewa Belmont	2	Draught ..	C. H. Perkins ..	Rainbow
1414	William Direct ..	4	Light ..	S. Richards ..	Nerrina
1235	Wotan	A	Thoroughbred	Dickinson Bros...	Sebastopol
1203	W. W. Estell ..	A	Light ..	J. Hannah ..	Donald
1443	Yet Again ..	A	Pony ..	Joseph Beard ..	Terang
1318	Young Buchlyvie ..	2	Draught ..	J. H. Hamilton ..	Stanhope
1391	,, Clydeside ..	A	,, ..	W. Fozard ..	Bendigo
1496	,, Dandy's Pride	A	Pony ..	J. W. Powell ..	Beeac
1415	,, Flashlight ..	A	Draught ..	J. J. Norman ..	Bairnsdale
1319	,, Lymm Champion	3	,, ..	W. H. Penaluna	Boolarra
1326	,, McLeish ..	A	,, ..	Jas. Charlton ..	Stony Creek
1389	,, Nobby ..	A	Pony ..	L. Durling ..	Powlett River
1495	,, Prince ...	A	Draught ..	W. Splatt ..	Inverleigh
1236	,, Recruit ..	A	Pony ..	E. W. Waters ..	Echuca East
1371	,, United Prince	A	Draught ..	W. G. Young ..	Nerrin
1372	Zolock O.	A	Light ..	D. McLeod ..	Numurkah
1390	Zone Time ..	3	Draught ..	Jno. Gibson ..	Benambra

ARTIFICIAL FERTILIZERS.

List of Fertilizers Registered Under the Fertilizers Act for the Year 1923.

P. Rankin Scott, Chemist for Agriculture.

What is a Fertilizer?

A fertilizer is defined under the Act to be any material containing nitrogen, phosphoric acid, or potash which has been manufactured, prepared, or produced in any manner for the purpose of fertilizing the soil, or supplying nutriments to the plant.

Registration of Brands.

All manufacturers or importers of fertilizers who intend offering for sale any such material as above described shall, on or before the first day of November in each year, make application to the Director of Agriculture for the registration of a brand in respect to any such fertilizer. Every such application shall set forth—

(*a*) The full name and place of business of the applicant.

(*b*) The figure, trade mark, or other sign to be attached to or associated with the fertilizer.

(*c*) A statement of the results of a chemical analysis, stating the proportion per centum in which the fertilizer contains the three ingredients, and the respective forms in which they occur.

(*d*) The retail price per ton of the fertilizer.

Unit Value.

Unit value is the value of 1 per cent. of nitrogen, phosphoric acid, or potash in 1 ton of a fertilizer.

From the results of the analyses of fertilizers as set forth in the application for the registration of brands, and taking into account the constituents which have a commercial value, and the value thereof in the simple fertilizers in which they occur, the average unit values shall be calculated. Simple fertilizers are those having a definite chemical composition and those of animal origin such as blood and bonedust.

The unit values are useful for comparative purposes, and offer some guide to the buyer in arriving at the commercial value of any of the fertilizers. Upon the sale of any fertilizer the vendor is required to give to the purchaser an invoice certificate stating the analysis of the fertilizer, which should correspond to the analysis on the label attached to the bag. With the aid of either and the unit value calculated for the respective form of the ingredients stated, the commercial value can be calculated by multiplying the percentage of the ingredient by the unit value for same. The following typical examples will illustrate the principle to be followed:—

SUPERPHOSPHATE.

Analysis.		Unit Value.						
			s.	*d.*		£	*s.*	*d.*
Phosphoric Acid, Water Soluble...	17.00%	×	6	0	=	5	2	0
Phosphoric Acid, Citrate Soluble	0.50%	×	5	0	=	0	2	6
Phosphoric Acid, Citrate Insoluble	0.50%	×	1	0	=	0	0	6
Total	18.00%							
Value per ton						£5	5	0

BONEDUST.

		Analysis.
Nitrogen		3.62%
Phosphoric Acid		21.74%
		Mechanical Condition.
Fine Bone		71.5%
Coarse Bone		28.5%
Nitrogen in fine bone ...	$\frac{3.62\% \times 71.5\%}{100}$ =	2.59%
Nitrogen in coarse bone ...	$\frac{3.62\% \times 28.5\%}{100}$ =	1.03%
Phosphoric Acid in fine bone ...	$\frac{21.74\% \times 71.5\%}{100}$ =	15.54%
Phosphoric Acid in coarse bone ...	$\frac{21.74\% \times 28.5\%}{100}$ =	6.20%

		Unit Value. s.	d.		£	s.	d.
Nitrogen as fine bone ...	2.59% ×	24	0	=	3	2	2
Nitrogen as coarse bone ...	1.03% ×	24	0	=	1	4	9
Phosphoric Acid as fine bone	15.54% ×	6	0	=	4	13	3
Phosphoric Acid as coarse bone	6.20% ×	5	0	=	1	11	0
Value per ton					£10	11	2

FERTILIZERS ACT 1915 (No. 2652).—LIST OF UNIT VALUES FOR THE YEAR 1923.

	£	s.	d.
Nitrogen, as Nitrate	1	5	10
,, Ammonia	0	17	8
,, Blood	1	4	0
,, Blood and Bone	1	4	0
,, Bone and Flesh	1	4	0
,, in Fine Bone	1	4	0
,, Coarse Bone	1	4	0
Phosphoric Acid—			
Water Soluble	0	6	0
Citrate Soluble	0	5	0
Citrate Insoluble in the following :—			
Superphosphates	0	1	0
Nitro-supers	0	1	0
Basic Phosphates	0	1	0
Complete Manures	0	1	0
Market Garden Manures	0	1	0
Bone and Supers	0	6	0
Bone Fertilizers	0	5	0
Ground Rock, Phosphates	0	2	9
Phosphoric Acid in Fine Bone	0	6	0
,, ,, Coarse Bone	0	5	0
Roasted and Intensely Ground, Phosphate	0	5	10
Potash	0	8	11

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923.

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Bone and Flesh.	As Unspecified.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mainly Nitrogenous.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Nitrate of Soda ..	Federal, S.N. ..	15·50	..	..	..	..	15·50	..	..	..	..	..	20 0 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Mt. Lyell, M.L., in diamond	15·50	..	..	..	..	15·50	..	..	..	..	..	20 0 0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	15·50	..	..	..	..	15·50	..	..	..	..	..	20 0 0	Wischer and Co. Pty. Ltd., 153 William-street. Melbourne
,, ,, ..	"Sickle"	15·50	..	..	..	..	15·50	..	..	..	..	..	20 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
Sulphate of Ammonia ..	Federal, A.S. ..	..	20·00	..	..	..	20·00	..	..	..	..	..	18 0 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Mt. Lyell, M.L., in diamond	..	20·00	..	..	..	20·00	..	..	..	..	..	18 0 0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	20·00	..	..	..	20·00	..	..	..	..	..	18 0 0	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
,, ,, ..	"Sickle" ..	..	20·00	..	..	..	20·00	..	..	..	..	..	18 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	M.G. Co., in diamond	..	20·59	..	..	..	20·59	..	..	..	..	..	17 7 6	The Metropolitan Gas Company, Flinders-street, Melbourne
,, ,, ..	G.G.C., in diamond ..	..	20·90	..	..	..	20·90	..	..	..	..	..	18 0 0	The Ballarat Gas Co., Ballarat
Blood Manure	Rohs, in circle ..	..	..	9·50	..	..	9·50	..	..	..	..	..	14 0 0	P. Rohs Pty. Ltd., Bendigo Bone Mills, Bendigo East
,, ...	M.C.C., in diamond ..	..	..	8·00	..	..	8·00	..	..	1·22	1·22	0·52	7 15 0	Melbourne City Council, City Desiccating Works, Smithfield-road, Kensington
,, ...	"Arch"	..	..	10·50	..	..	10·50	..	..	1·50	1·50	..	12 0 0	Ballarat and District Co-op. Freezing Co. Ltd., Learmonth street, Alfredton, Ballarat

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.			Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Bone and Flesh.	As Unspecified.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.					
Mainly Potassic.		%	%	%	%	%	%	%	%	%	%	%	£	*s.*	*d.*	
Sulphate of Potash ..	Federal	..	..	..	..	..	..	..	..	..	..	50·00	22	5	0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	"Sickle"	..	..	..	..	..	..	..	..	..	..	50·00	22	5	0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L., in diamond	..	..	..	..	..	..	..	..	..	..	50·00	22	5	0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	..	..	..	50·00	22	5	0	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
,, ,, ..	Hasell's	..	..	..	..	..	..	..	..	..	..	48·65	25	0	0	Arthur Harry Hasell, 17 Queen-street, Melbourne
Mainly Phosphatic—Readily Soluble.																
Superphosphates ..	Federal, O.S. ..	..	..	..	..	..	..	17·00	0·50	0·50	18·00	..	5	5	0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	"Sickle," Florida Super	..	..	..	..	..	..	17·00	0·50	0·50	18·00	..	5	5	0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Mount Lyell, M.L., in diamond, No. 1	..	..	..	..	..	..	17·00	0·50	0·50	18·00	..	5	5	0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	17·00	0·50	0·50	18·00	..	5	5	0	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
,, ..	Cresco 18 Super ..	..	..	..	..	..	..	17·00	0·50	1·00	18·50	..	5	5	0	Cresco Fertilizer Ltd., 111 North-terrace, Adelaide, South Australia
,, ..	Federal, S.S., Special, 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	6	7	6	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Bone and Flesh.	As Unspecified.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mainly Phosphatic—Readily Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Superphosphates ..	"Sickle," 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	6 7 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Mount Lyell, M.L., in diamond, M.L. Special, 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	6 7 6	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd., Special, 22 per cent.	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	6 7 6	Wischer and Co. Pty. Ltd., 150 William-street, Melbourne
..	Cresco 22 Super ..	..	..	..	..	..	..	21·00	0·50	1·00	22·50	..	6 7 6	Cresco Fertilizers Ltd., 111 North-terrace, Adelaide, South Australia
Moderately Soluble.														
Basic Phosphate ..	"Federal," B.P. ..	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 5 0	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	"Sickle"	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 5 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Mount Lyell, M.L., in diamond	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 5 0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	14·00	3·00	17·00	..	5 5 0	Wischer and Co. Pty. Ltd., 150 William-street, Melbourne
Slowly Soluble.														
Ground Phosphate ..	"Hasell's" Marion, 60 per cent.	..	..	..	..	..	..	..	..	27·50	27·50	..	5 0 0	Arthur Harry Hasell, 17 Queen-street, Melbourne
,, ..	Federal, G.P. ..	..	..	..	..	..	..	..	..	36·65	36·65	..	5 2 6	The Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ..	"Sickle," 80 per cent.	..	..	..	..	..	..	..	..	36·65	36·65	..	5 2 6	Cuming, Smith, and Co. Pty. Ltd. 65 William-street, Melbourne
,, ..	"Sickle," 60 per cent.	..	..	..	..	..	..	..	..	27·50	27·50	..	4 7 6	,, ,, ,,
,, ..	"Sickle," 50 per cent.	..	..	..	..	..	..	..	..	23·00	23·00	..	4 0 0	,, ,, ,,

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Bone and Flesh.	As Unspecified.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Mainly Phosphatic—Slowly Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Ground Phosphate ..	Mount Lyell, M.L., in diamond, 80 per cent.	..	..	..	..	..	..	..	..	36·65	36·65	..	5 2 6	The Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Mount Lyell, M.L., in diamond, 60 per cent.	..	..	..	..	..	..	..	..	27·50	27·50	..	4 7 6	,, ,, ,,
,, ..	Mount Lyell, M.L., in diamond, 50 per cent.	..	..	..	..	..	..	..	..	23·00	23·00	..	4 0 0	,, ,, ,,
,, ..	Wischer and Co. Pty. Ltd., 80 per cent.	..	..	..	..	..	..	..	..	36·65	36·65	..	5 2 6	Wischer and Co. Pty. Ltd., 150 William-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd., 60 per cent.	..	..	..	..	..	..	..	..	27·50	27·50	..	4 7 6	,, ,, ,,
,, ..	Wischer and Co. Pty. Ltd., 50 per cent.	..	..	..	..	..	..	..	..	23·00	23·00	..	4 0 0	,, ,, ,,
Roasted and Intensely Ground Phosphate	"Victoria," Phosphate	..	..	..	..	..	..	..	3·00	12·00	15·00	..	4 8 6	The Phosphate Co-operative Co. of Australia Ltd., 440 Little Collins-street, Melbourne
Coarsely Ground Phosphate	Victoria Phosphate, No. 3	..	..	..	..	..	..	..	..	14·00	14·00	..	2 16 0	,, ,, ,,
,, ,,	Victoria Phosphate, No. 4	..	..	..	..	..	..	..	..	11·00	11·00	..	2 5 0	,, ,, ,,
Mixed Manures. Containing Nitrogen and Phosphoric Acid. Moderately Soluble.														
Market Garden ..	"Sickle"	..	1·50	..	0·56	1·00	3·06	9·77	1·00	1·16	11·93	1·87	8 2 6	Cuming, Smith, and Co. Pty. Ltd. 65 William-street, Melbourne
,, ..	Mt. Lyell, M.L., in diamond	..	1·50	..	0·56	1·00	3·06	9·77	1·00	1·16	11·93	1·87	8 2 6	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd.	..	1·50	..	0·56	1·00	3·06	9·77	1·00	1·16	11·93	1·87	8 2 6	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
,, ..	Federal, M.G. ..	..	1·50	..	0·56	1·00	3·06	9·77	1·00	1·16	11·93	1·87	8 2 6	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Bone and Flesh.	As Unspecified.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen, Phosphoric Acid, and Potash. Fairly Soluble.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Complete Manure ..	"Sickle No. 1" ..	..	1·50	..	..	1·00	2·50	9·92	0·29	0·29	10·50	7·05	9 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
" ..	Mt. Lyell, M.L., in diamond, No. 1	..	1·50	..	..	1·00	2·50	9·92	0·29	0·29	10·50	7·05	9 10 0	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
" ..	Wischer and Co. Pty. Ltd., No. 1	..	1·50	..	..	1·00	2·50	9·92	0·29	0·29	10·50	7·05	9 10 0	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
" ..	Federal, No. 1 ..	..	1·50	..	..	1·00	2·50	9·92	0·29	0·29	10·50	7·05	9 10 0	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
" ..	Sickle, No. 2 ..	..	1·00	..	..	1·00	2·00	10·04	0·29	0·29	10·62	4·46	7 17 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
" ..	Mt. Lyell, M.L., in diamond, No. 2	..	1·00	..	..	1·00	2·00	10·04	0·29	0·29	10·62	4·46	7 17 6	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
" ..	Wischer and Co. Pty. Ltd., No. 2	..	1·00	..	..	1·00	2·00	10·04	0·29	0·29	10·62	4·46	7 17 6	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
" ..	Federal, No. 2 ..	..	1·00	..	..	1·00	2·00	10·04	0·29	0·29	10·62	4·46	7 17 6	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
" ..	Anglo - Continental Guano	..	4·87	..	..	..	4·87	8·85	2·39	1·37	12·61	1·89	23 10 0	Gibbs, Bright, and Co., 34 Queen-street, Melbourne
Containing Phosphoric Acid and Potash. Slowly Soluble.														
Mixed Manure ..	Mixed Victoria Phosphate and Potash Sulphate	..	..	..	..	..	..	..	4·00	9·50	13·50	5·00	8 6 0	The Phosphate Co. of Australia Ltd., 440 Little Collins-street, Melbourne
Containing Nitrogen and Phosphoric Acid— Readily Soluble.														
Nitro-Superphosphate ..	Federal, N.S. ..	..	1·50	..	0·50	..	2·00	13·00	1·01	1·15	15·16	..	7 2 6	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Bone and Flesh.	As Unspecified.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid—Readily Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Nitro-Super	"Sickle"	..	1·50	..	0·50	..	2·00	13·00	1·01	1·15	15·16	..	7 2 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
Nitro-Superphosphate ..	Mount Lyell, M.L. in diamond	..	1·50	..	0·50	..	2·00	13·00	1·01	1·15	15·16	..	7 2 6	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd.	..	1·50	..	0·50	..	2·00	13·00	1·01	1·15	15·16	..	7 2 6	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
Bonedust and Super ..	Bendigo, Rohs, in circle	..	..	..	1·50	..	1·50	8·50	5·25	4·25	18·00	..	8 15 0	P. Rohs Pty. Ltd., Bendigo Bone Mills, Bendigo East
Super and Bone ..	"Sickle"	..	..	..	0·75	..	0·75	14·45	1·37	1·58	17·40	..	6 12 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Federal. B.S.	..	..	..	0·75	..	0·75	14·45	1·37	1·58	17·40	..	6 12 6	Australian Explosives and Chemical Co. Ltd. 370 Little Collins-street, Melbourne
,, ..	Mt. Lyell, M.L., in diamond	..	..	..	0·75	..	0·75	14·45	1·37	1·58	17·40	..	6 12 6	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd.	..	..	..	0·75	..	0·75	14·45	1·37	1·58	17·40	..	6 12 6	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
Blood, Bone, and Super ..	Bendigo, Rohs in circle	..	..	..	4·00	..	4·00	5·50	6·25	2·25	14·00	..	10 10 0	P. Rohs Pty. Ltd., Bendigo Bone Mills, Bendigo East
,, ,, ..	Federal, B.B.S. ..	..	..	..	2·40	..	2·40	10·20	1·56	1·84	13·60	..	7 17 6	Australian Explosives and Chemical Co. Ltd., 370 Little Collins-street, Melbourne
,, ,, ..	Sickle	..	..	..	2·40	..	2·40	10·20	1·56	1·84	13·60	..	7 17 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L., in diamond	..	..	..	2·40	..	2·40	10·20	1·56	1·84	13·60	..	7 17 6	Mount Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Bone and Flesh.	As Unspecified.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid—Readily Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Blood, Bone, and Super	Wischer and Co. Pty. Ltd.	..	..	..	2·40	..	2·40	10·20	1·56	1·84	13·60	..	7 17 6	Wischer and Co. Pty. Ltd., 153 William-street, Melbourne
Bone and Super ..	Gardiner's	..	..	..	1·39	..	1·39	3·20	5·80	8·00	17·00	..	7 15 0	George Gardiner and Co. Pty. Ltd., Marshall, Geelong
Moderately Soluble.														
Blood and Bone ..	Arch	..	..	5·00	..	..	5·00	..	3·50	9·00	12·50	..	9 0 0	Ballarat and District Co-op. Freezing Co. Ltd., Learmonth-street, Alfredton, Ballarat
Bonedust and Blood ..	Bendigo, Rohs, in circle	..	..	6·00	..	..	6·00	..	3·00	6·00	9·00	..	12 10 0	P. Rohs Pty. Ltd., Bendigo Bone Mills, Bendigo East
Bone Fertilizer ..	Samson's	..	..	..	2·00	..	2·00	..	2·00	15·00	17·00	..	7 12 6	George Gardiner and Co. Pty. Ltd., Marshall, Geelong
,, ..	Gardiner's Special Magic Fertilizer	..	..	5·00	..	..	5·00	..	3·00	10·00	13·00	..	8 5 0	,, ,, ,,
,, ..	No. 2 Magic ..	..	..	..	1·50	..	1·50	..	1·50	14·50	16·00	..	7 5 0	,, ,, ,,
,, ..	No. 1 Magic ..	..	..	..	2·00	..	2·00	..	2·00	15·00	17·00	..	7 12 6	,, ,, ,,
,, ..	Bailey Bros. ..	..	..	..	2·50	..	2·50	..	6·50	9·50	16·00	..	8 0 0	Bailey Bros., 155 Main-street, Ballarat East
Animal Fertilizer ..	A.N.A., Surprise ..	..	..	..	3·00	..	3·00	..	4·00	12·00	16·00	..	9 10 0	George W. Pennell, Braybrook
Bone Fertilizer ..	Ark	..	..	..	3·16	..	3·16	..	3·66	15·60	19·26	..	7 10 0	Arthur Murphy, Barkly-street, Ararat

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1923—*continued.*

Description of Fertilizer.	Brand.	Nitrogen as Bone.	Phosphoric Acid.	Mechanical Condition.		Price asked per ton.	Where Obtainable.
				Fine Bone.	Coarse Bone.		
		%	%	%	%	£ s. d.	
Bonedust	Horse Shoe ..	4·00	18·00	40·00	60·00	9 10 0	P. Fitzgerald and Sons, Warragul-road, Bentleigh
"	Bailey Bros., Mount Clear	3·00	18·00	30·00	70·00	8 10 0	Bailey Bros., 155 Main-street, Ballarat
"	Bendigo, Rohs, in circle	4·00	18·00	55·00	45·00	10 10 0	P. Rohs Pty. Ltd., Bridge-street, Bendigo
"	White Horse ..	2·50	17·00	60·00	40·00	7 15 0	Frederick Walter Richards, Warrenheip
"	Tooram, G. Bros. ..	3·62	21·74	71·50	28·50	8 10 0	Chas. Wm. Gladman, Allansford

Melbourne, 28th November, 1922.

P. RANKIN SCOTT,
Chemist for Agriculture.

THE LARGE WHITE PIGS.

Genesis of the Breed.

In an English exchange, Professor James Long has told the story of the Large White pig. It is, he says, difficult to believe that prior to 1851 British pigs were practically mongrels, and that since that date they have not only changed the whole aspect of the industry, but they have improved the pigs of every important agricultural country in the world. Mr. Long states that he is aware of no single breed outside the British Islands—the United States excepted—which is worthy to be classed in the same category as our own pure-bred varieties. The Berkshire was regarded as a pure breed in the first half of last century, but it was little better than a mongrel, and not until the appearance of the Large White York at the Royal Show in 1851 had there been any symptom of that extraordinary improvement in the pig which has since taken place.

In the northern counties pigs had been kept in herds and at liberty for ages. They were of large size; they possessed long bodies and long heads, large ears, flat sides, plenty of coarse hair, and legs which enabled them to walk long distances to market. The breeder of the Large York —Tuley, a Keighley weaver, made use of types of pig which enabled him to evolve the new variety—grafting upon size those symmetrical and feeding properties which have since made it famous. No breed has achieved such fame, and none has so far distanced all competitors in size and quality.

The Large York, continues the Professor, has a straight back, a wide loin, well-sprung ribs, large well-formed hams, meat down to the hocks, straight legs, a deep thick belly, adapting it to the production of abundance of streaky meat for pickled pork or rashers for the breakfast table; and a neck of medium length, without that thickness of collar which provides so large a quantity of cheap meat at the fore-end of the flitch. The head is long, and not dished, as in the Middle breed, while the ears—no longer the large white flappers of the past—are medium, well-formed and straight, standing well forward over the face.

The chief qualifications of the Large White are constitution, rapid growth, fine quality of meat, without too much fat, and great size, which tells at an early age.

The Large White has been used in the improvement of other breeds, as well as in the conversion of the common pigs of the country into swine of a useful character; and it is largely owing to its influence that bacon of to-day is young, tender, and such a favorite food. In earlier days pigs were not killed, as a rule, until they were eighteen months old, but it is now the common practice to slaughter porkers under twenty weeks and baconers a month or two later. This practice not only secures superior meat, but it is produced so much cheaper—it no longer paying to feed for larger size.

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

If the work has not already been done, the orchard should be kept in constant cultivation so as to conserve the abundant spring rains. Should the summer become hot and dry, this will be a very necessary precaution. Even where the soil had been previously well cultivated, the cultivators should again be run over the surface, as any hot weather will cause the soil to crust, which would be the means of dissipating a very considerable amount of soil water. Every effort should be taken to retain this moisture so that the fruit crops shall have all they require for their perfection. To further attain this end no weeds should be allowed to grow in orchard soils.

Budding.

Young trees, or old trees that have been previously cut down in preparation for budding, may be worked towards the end of the month. It is advisable to select dull, cool weather for this operation, so that the sap may run more freely, and that atmospheric conditions may not have too drying an effect on the bud. The operation of budding is a very simple one, and is easily performed. To gain a successful end, the sap should be flowing freely, so that when the cuts are made the bark should "lift" or "run" easily, and without any clinging or tearing of the fibres, and it should separate freely from the wood. The bud selected should be firm and well matured, and should show no signs of premature growth whatever. It should be cut from the scion with a shallow cut, and if any wood be left in the cutting it should be taken out of the bud. A smooth, clean spot should be selected on the bark of the stock, and a T-shaped cut made, the vertical cut being longer than the horizontal one. The bark at the point where the cuts meet should be raised, and the bud inserted between the bark and the wood of the stock. The bud should be gently pressed down into position, and then bound with soft twine, string, or raffia. If the bud be too long for the cut, the top may be cut off level by means of a horizontal cut. With practice it will soon become possible to take the buds so that they will need neither cutting nor trimming.

After two or three weeks the buds should be examined to see if they have "taken"—that is, if the bud has united thoroughly to the stock. When this occurs, the tie may be cut. If a growth be desired at once all wood above the bud may be cut off some short distance above the bud, so as to prevent any bark splitting, and consequent loss of the bud, and so as to throw the bud out at a fair angle. Ultimately this should be properly trimmed.

If desired, the bud may be left dormant throughout the autumn and winter till spring. In this case the branch should not be cut off, but left on till the usual winter pruning.

Summer Pruning.

The profuse spring rains have caused a vigorous growth in the fruit trees. In order to more economically utilize this abundant

growth, it should be now summer pruned, particularly on the apple and pear trees. Care should be observed that as much of the leafage as possible is retained on the tree. Unduly long laterals of fruiting trees may be shortened back, always cutting to a leaf. Unnecessary terminal leader growths, of which there are sometimes three or four, all strong growing, may be reduced to one, retaining this one as a leader. In no case should this growth be cut or interfered with in any way.

The results of these cuts will be to divert the sap which was flowing into growths that would subsequently be pruned, into more profitable channels, so that weak buds and growths may be strengthened, and induced into fruit bearing.

The Vegetable Garden.

The work in this section is much the same as in the flower garden. Good mulching and regular soil stirring will be the work for the month. As soon as any bed is cleared of vegetables it should be manured and well dug over in preparation for the next crop. Deep digging is always desirable in vegetable growing. If any pest, such as aphis, or caterpillars, or tomato weevil, have been present, it would be advisable to burn all the crop refuse, or to destroy any insects that remain, and to give the plot a dressing of gypsum, or of Clift's manurial insecticide.

Keep the tomatoes well watered and manured, pinching out surplus and strong grown laterals. In early districts the onion crop will be ripening. In late districts, or with late crops, the ripening may be hastened by breaking down the top. An autumn crop of potatoes may be planted. Cabbage, cauliflower, lettuce, and celery plants may be planted out. Keep asparagus beds well watered.

The Flower Garden.

January should be a busy month in the garden. It may be necessary to water frequently, and after every watering the surface should be well loosened, and stirred with the hoe to keep it moist and cool. More cultivation and less water is a good rule to be observed. The hoe should be used more, and the hose less, in summer; greater benefits will accrue, and the water bill will be considerably reduced. Mulchings with straw, grass, &c., are very useful just now. The mowings from lawns form valuable mulching. Waste tobacco stems are also valuable as a mulch.

Dahlias, chrysanthemums, gladioli and other tall-growing, slender herbaceous plants will require support in the way of stakes. They will also need mulching considerably. These plants should receive no check whatever, and should be continued with a regular even growth right through the season. Another desideratum is that soils should be well drained, as plants of all descriptions thrive better in well-drained soils.

A sharp look-out should be kept on these plants for attacks of red spider. If this insect appears, a good spraying of tobacco solution or benzole emulsion should be given.

Constant watch will need to be kept for the various small caterpillars that attack the buds of these plants. Spraying with a weak solution of paris green and lime, or similar insecticide, will be useful. Hand-picking should also be resorted to.

REMINDERS FOR FEBRUARY.

LIVE STOCK.

HORSES: *At grass.*—Supplement dry grass, if possible, with some greenstuff. Provide plenty of pure water and shade shelter. *In stable.*—Supplement hard feed with some greenstuff, carrots, or the like, and give a bran mash once a week at least. Avoid over-stimulating foods, such as maize and barley. Give hard feed in quantities only consistent with work to be performed. Stable should be well ventilated. and kept clean. When at work, give water at short intervals. Always water before feeding. Great benefit will result in supplying horses—more especially young ones running at grass—with a lick. The following one is recommended:—

Salt	20 parts
Lime	20 parts
Superphosphate	10 parts
Sulphate of iron	5 parts.

By having troughs constructed that will protect the lick from rain a considerable saving will be made.

Horses at grass require their feet attended to at frequent intervals, otherwise deformity of feet and lameness may result.

CATTLE.—Provide succulent feed and plenty of clean water easy of access; also shade and salt lick in trough. Have each cow's milk weighed and tested for butter fat regularly. Rear heifer calves from those that show profitable results. Give milk at blood heat to calves. Keep utensils clean or diarrhœa will result. Do not give too much at a meal for the same reason. Give half-a-cup of limewater per calf per day in the milk. Let them have a good grass run or lucerne, or half-a-pound of crushed oats in a trough. Dehorn all dairy calves except those required for stud or show purposes. Keep bulls away from cows.

PIGS.—Sows about to farrow should be supplied with short bedding in well-ventilated styes. All pigs should be provided with shade and water to wallow in. There will be plenty of cheap feed available now, and there is a good margin between cost of feed and price for fat pigs. Read *Bulletin* No. 16.

SHEEP.—In the case of very strong cross ewes, rams should not be removed until well on in this month, for this class, together with most pure ewes of British blood, are only now coming in season. To breed out this late lambing tendency, and to procure quality and quantity of wool as well as a good carcass, use carefully-bred, level-made merino rams. If the right type be not procurable at reasonable rates, use good Corriedales or Comebacks. Should there be among the rams any inferior to the others, keep them back for three weeks. Remember, narrow inferior rams are invariably the most active workers compared with sheep of more substance.

POULTRY.—Chickens should now be trained to perch; they will be more healthy.

Provide plenty of green feed and give less grain and meat. Avoid condiments. Keep water in cool shady spot and renew three times each day. Keep dust bath damp.

Birds showing symptoms of leg weakness should be given 1 grain of quinine per day (three months old chickens, ½ grain) and plenty of milk.

CULTIVATION.

FARM.—See that haystacks are weatherproof. Cultivate stubble and fallow, and prepare land for winter fodder crops. Get tobacco sheds ready for crop. In districts where February rains are good, sow rye, barley, vetches, and oats for early winter feed.

ORCHARD.—Spray for codlin moth. Search out and destroy all larvæ. Cultivate the surface where necessary and irrigate where necessary, paying particular attention to young trees. Fumigate evergreen trees for scale. Continue budding.

FLOWER GARDEN.—Cultivate the surface and water thoroughly during hot weather. Summer-prune roses by thinning out the weak wood and cutting back lightly the strong shoots. Thin out and disbud dahlias and chrysanthemums. Layer carnations. Plant a few bulbs for early blooms. Sow seeds of perennial and hardy annual plants.

VEGETABLE GARDEN.—Continue to plant out seedlings from the seed-beds. Sow seeds of cabbage, lettuce, cauliflower, peas, turnips, and French beans. Keep all vacant plots well dug.

VINEYARD.—February is the best month for the "yema," or summer bud graft (see *Bulletin* No. 35, available on application). Select and mark the best-bearing vines of varieties from which scions will be required for next spring's grafting.

Given suitable climatic conditions, downy mildew will make its appearance. If vines were not sprayed in January they should be sprayed this month. The final spray (January or February) is most important for the protection of the foliage, thus insuring the ripening of the fruit and well-nourished wood, without which a good crop cannot be expected next year. Sulphur again, if oidium is prevalent, but avoid sulphuring wine grapes too short a time before gathering. The sulphur may be mixed with Bordeaux mixture, thus enabling the two diseases, oidium and downy mildew, to be combated simultaneously.

Cellars.—Prepare all plant and casks for the coming vintage. An ounce of bisulphite of potash, or a couple of fluid ounces of bisulphite of soda solution, to each bucket of water used to swell press platforms, tubs, &c., will help to keep it sweet. Keep cellars as cool as possible. Complete all manipulations so as to avoid handling older wines during vintage.

In the case of very hot weather occurring during vintage, attention is directed to the new wine-making method by "Preliminary Maceration," described in a pamphlet obtainable on application.

UNITED STATES BACON EXPORT.

It is reported that a movement has been started in the United States which has for its object the improvement of the quality of bacon intended for the British market. Up to the present, American exporters have supplied the British market with a heavy volume of cheaper bacon than that offered by other exporting countries, but no special attention appears to have been given to quality. It is understood that what is proposed is a thorough study by the United States Department of Agriculture, or other competent authority, of the problem so far as improved production is concerned, combined with co-operation between the packers' and producers' organizations in finding out British requirements and bringing their products up to this standard.—*Agriculture at Home and Abroad* (Eng.)., September, 1922.

RAPE The Food for Sheep

SOW NOW FOR QUICK GREEN FEED

RAPE is a profitable Winter crop, and is valuable for pasturing sheep during the Winter months.

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Sow now, it will catch the Autumn rains, and will be ready for pasturing in about 10 weeks. A crop is thus available for stocking before the Winter sets in.

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A sturdy and rapid grower; it has a strong tap-root, enabling it to stand long periods of drought. Stalks break easily, and are very succulent right through. **Will not taint the milk.** Sow 4 to 6 lbs. per acre in drills; 8 to 12 lbs. broadcast. **Will fatten 3 more sheep per acre than any other kind. 1/3 lb.; 130/- cwt.**

Dwarf Essex

Imported English (true). 1/1 per lb.; 112/- per cwt.
Dutch. 1/- per lb.; 93/4 per cwt.
New Zealand. (From imported English Seed.) 10d. per lb.; 85/- per cwt.

White Mustard

Prevents Blowing in Sheep. 1 lb. per acre with Rape. 1/6 per lb.; 150/- per cwt.

Egyptian or Berseem Clover

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A Great Winter Fodder

Recommended as an annual Winter Clover for warm countries where irrigation is practised. Valuable for its green or dried fodder, and as a winter soiling crop for orchards, vineyards, &c., on irrigated land. A strong-growing annual, with succulent, fleshy stems and broad, soft leaves. The flowers are cream or pale yellow in colour, and are clustered together in a compact, cylindrical spike.

The first cut is available from 45 to 60 days after sowing, followed by a second and third cut, and sometimes a fourth, although the latter is never heavy, and is usually reserved for seed. All kinds of stock eat it readily, and it may be given to them at any stage of growth; it does not taint milk in the slightest degree. This Clover will re-seed itself in a pasture on good land, and thus becomes practically permanent.

Fallow must be thoroughly clean prior to seeding. Sow through the drill, but care should be taken to see that the points of the drill are kept just on the surface of the ground.

Graze lightly, or cut when plants are a few inches high. They will then stool out well. **Sow 8 to 12 lbs. per acre in drills, or 20 to 30 lbs. broadcast. 2/- per lb.; 1/10 per lb. in 14 lb. lots; 1/9 per lb. in 28 lb. lots or more.**

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DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department will shortly have completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter ***fat*** yielded.

(For Record of Yields of dams see Red Poll Herd Book.)

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G.G. Sire's D. Dam's	,,	12565 ,,	...	10 ,, ,,	8853 ,,
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Inspection of the Herd is Invited.

Visitors will be met at the Station on notifying the Manager, State Research Farm, Werribee.

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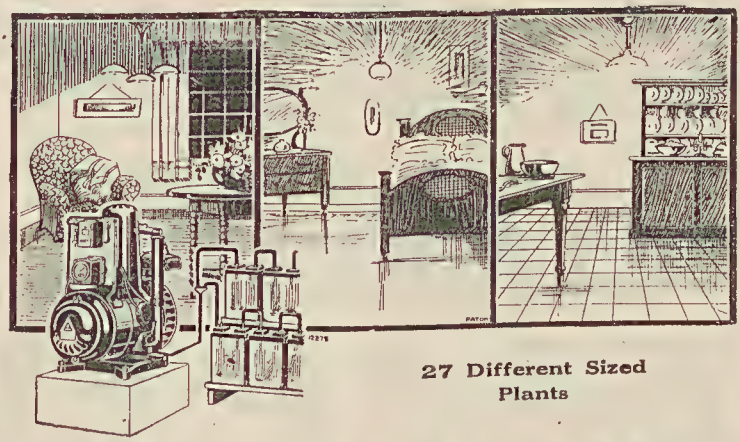

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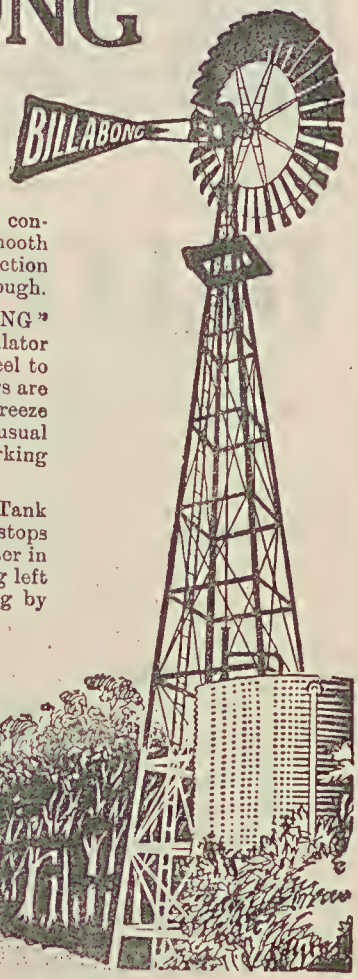

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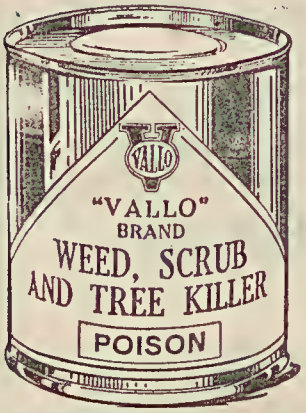

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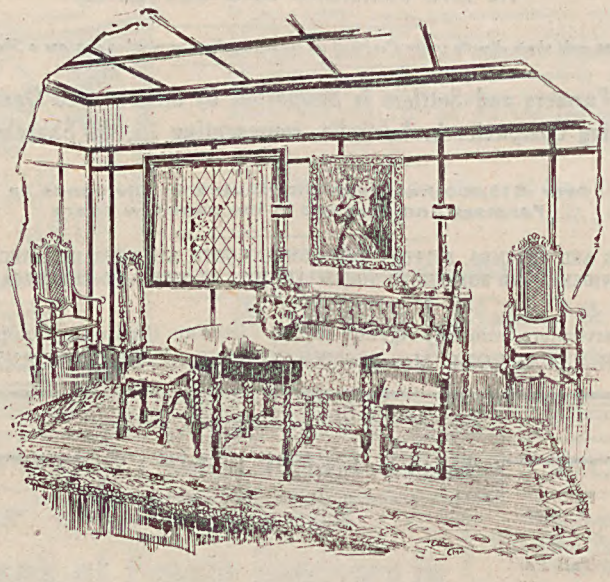

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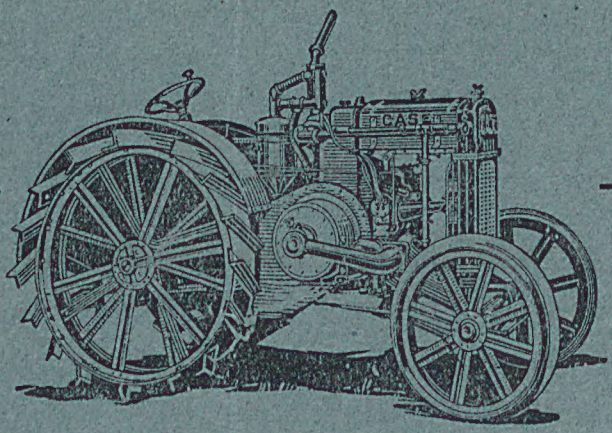

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